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ANNUAL SUMMARY, 1898.

INTRODUCTION.

The present annual summary completes the discussion of the meteorology of India for the year 1898.

It should be noted that in the monthly reviews it is attempted to present the facts and data from two different points of view. Meteorological data in India are chiefly utilized for the following purposes :—

1st.—In the discussion of the prevalence and spread of diseases, more especially of cholera and other diseases of an epidemic character.

2nd.—In connection with agricultural questions, more especially the progress and character of the crops as determined by the weather conditions of the period.

India has hence been divided into two groups of divisions from what may be termed the medical and agricultural stand-points. For the comparison of medical and meteorological statistics, India is arranged into the following provinces, which are believed to be fairly homogeneous so far as the conditions of the prevalence of the more common diseases are concerned :—

- (1) Burma Coast and Bay Islands.
- (2) Burma Inland.
- (3) Assam.
- (4) Bengal and Orissa.
- (5) Gangetic Plain and Chota Nagpur.
- (6) Upper Sub-Himalayas, including the sub-montane districts of the North-Western Provinces and the Punjab, and the meteorological divisions of the South-East, South, Central and North Punjab.
- (7) Indus Valley and North-West Rajputana.
- (8) East Rajputana, Central India and Gujarat.
- (9) Deccan.
- (10) West Coast.
- (11) South India.

The data for each of these divisions are given in Table I in large figures, and the portion of each monthly review entitled, "Summary of the chief features of the weather in India during the month," is intended to give a sketch of the broader and more important features of the weather in India for the use of those who study the relations between the prevalence and spread of diseases and the weather conditions prevailing at the time in India.

According to the second method of arrangement into meteorological divisions, India is divided into 57 meteorological districts, or divisions, from the agricultural standpoint, each of which is fairly homogeneous so far as the

distribution of rainfall and the general character of the crops and the conditions of their growth are concerned. The following gives the two series of divisions arranged under the respective political areas or provinces to which they belong :—

Political Division or Province.	Meteorological Division or District.	Meteorological Province.
BURMA	Tenasserim and Bay Islands.	Burma Coast and Bay Islands.
	Lower Burma	
	Arakan	Burma Inland.
	Central Burma	
ASSAM	Upper Burma	Assam.
	Assam (Surma)	
	„ Brahmaputra	Bengal and Orissa.
	East Bengal	
BENGAL	Deltaic Bengal	Bengal and Orissa.
	Central Bengal	
	North Bengal	Gangetic Plain and Chota Nagpur.
	Orissa	
	Chota Nagpur	Upper Sub-Himalayas.
	South Bihar	
NORTH-WESTERN PROVINCES AND OUDH.	North „	Indus Valley and North West Rajputana.
	North-Western Provinces, East.	
	North-Western Provinces, Central.	East Rajputana, Central India and Gujarat.
	South Oudh	
	North „	Upper Sub-Himalayas.
	North-Western Provinces, East Sub-montane.	
PUNJAB	North-Western Provinces, West Sub-montane	Indus Valley and North West Rajputana.
	South-East Punjab	
	South „	East Rajputana, Central India and Gujarat.
	Central „	
	Punjab Sub-montane	Upper Sub-Himalayas.
	North Punjab	
BOMBAY NORTH	West Punjab	Indus Valley and North West Rajputana.
	Sind	
RAJPUTANA AND CENTRAL INDIA.	West Rajputana	East Rajputana, Central India and Gujarat.
	Central India, East.	
	Rajputana, East, Central India West.	Upper Sub-Himalayas.

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Political Division or Province.	Meteorological Division or District.	Meteorological Province.
BOMBAY NORTH	Kathiawar	East Rajputana, Central India and Gujarat.
	Gujarat	
NORTH-WESTERN PROVINCES.	North-Western Provinces, West.	
BOMBAY	Bombay Deccan . . .	Deccan.
	Khandesh	
BERAR	Berar	
CENTRAL PROVINCES	Central Provinces, West.	
	„ „ Central	
	„ „ East .	
HYDERABAD OR THE NIZAM'S DOMINIONS.	Hyderabad, North . .	
	„ South . .	
BOMBAY	Konkan	West Coast.
	Malabar	
	Madras, South . . .	
MADRAS	„ „ Central . .	
	„ East Coast South	
	„ Central	South India.
	„ East Coast Central	
	„ East Coast North	
COORG AND MYSORE .	Coorg	
	Mysore	
HILL DISTRICTS	Assam Hills	
	Bengal „	
	North-Western Provinces Hills.	Hills.
	Punjab Hills	
	Baluchistan Hills . .	

The double grouping is shown in Plate I at the end of this summary.

The data of Table I in the monthly reviews and in the present annual part are obtained, with a few exceptions, from the observations telegraphed daily to Simla for publication in the Daily Weather Report. In the case of thermometric observations, they are telegraphed to the nearest half degree. Hence the maxima and minima temperature data of the second class observatories derived from these telegraphic reports and given in that table occasionally differ to some slight extent from the means of the more exact data (recorded to tenths of a degree) tabulated in the observation forms sent into the Calcutta Office, and which are used in the calculation of the mean temperature data in Table II. There is also another reason why the mean maxima and minima data in Tables I and II differ to a slight extent. In Table I the daily or 24 hours' period is assumed to end at 8 A.M., and in Table II at 4 P.M., and hence the maximum temperature in Table I for any month of thirty-one days at any station gives the mean for thirty-one periods of 24 hours ending at 8 A.M., of the 31st, and in Table II for the same number of 24 hours' periods ending at 4 P.M. on the 31st and hence virtually of a monthly period one day in advance of the former. Similarly, for months of 28, 29, or 30 days. These remarks will explain some of the slight discrepancies which may be found between the maxima and minima temperature mean data in Tables I and II, and hence also in the monthly mean variation data given in these tables in the monthly reviews and annual summary.

The methods of exposure of the instruments at observatories in India, and of the reduction of the observations and the calculation of mean data, have been fully stated and explained in the Annual Reports on the Meteorology of India, and need not be repeated. The reader is referred more especially to the Annual Report of the year 1885 and to the "Instructions to observers of the Indian Meteorological Department" for full information on this subject.

Temperature.

The methods of exposing the thermometers at observatories in India and of deducing the daily and monthly means from the observed readings of the instruments are described in pages 18-19 of the Annual Report for 1890.

The variations of the mean temperature of each month from the normal given in Table II of the monthly reviews are deduced by a comparison of the actual monthly means with the normal monthly means obtained by the same methods given in Table XII of average monthly temperatures of 87 stations in India and Ceylon, etc., in pages 19 to 22 of the Annual Report for the year 1890. Average data for 134 stations will also be found in pages 39 to 42 of the Annual Report for the year 1887.

Average or normal monthly temperatures of 82 second class stations were recently recalculated and the whole of the data up to December 1896 utilized for the determination of these values. These normal means were given in Table I of the Annual Summary for 1896.

The variations obtained by a comparison of these normal means with the actual monthly means in Table II of the monthly weather reviews for the year are given in Table I.

The mean variations given in Table II of the Geographical Summary are derived from the variation data of Table II of the monthly weather reviews of the year 1898.

In Table I published in each monthly review, as in the Daily Weather Report, the mean temperature of the day is calculated by the formula, daily mean = $\frac{\text{Maximum} + \text{Minimum}}{2}$. It differs from the true daily mean by amounts varying slightly with the season. The variations of the daily or monthly actual means obtained by this method from normal daily or monthly means similarly calculated, usually differ very little from those obtained by the more laborious computation of true daily means and the comparison of these with normal true daily means. In Table I of the monthly weather reviews of the year 1898 the variations of the monthly mean maxima and minima temperatures from the normal as well as the variations of the monthly mean temperatures (*i.e.*, $\frac{\text{Maximum} + \text{Minimum}}{2}$) are given.

Normal monthly mean maxima and minima temperatures of 94 stations calculated from the observations of the eleven years' period, 1878—1888, were given in the Annual Summary for 1891. The additional data for the years 1889—93 have been recently utilized to furnish what are

probably slightly more accurate means than those given in the 1891 Annual Summary. The re-calculated means were given in the 1894 Annual Summary, Tables I and II and need not be repeated here.

Tables II and III(a), III(b) and III(c) give summaries of the temperature variation data for each month of the year 1898 and for the year. In the first table (Table II) the same division has been adopted as that employed in the Annual Reports from 1881 to 1890. This enables an exact comparison to be made of the temperature data of the year 1898 with those of previous years given in the Annual Reports. In the second set of tables [Table III(a), III (b) and III (c)] the variation data are given for the eleven meteorological provinces into which the empire is divided for the purpose chiefly of comparing meteorological and health statistics, and in the last table (Table IV) the data are given for 54 of the 57 smaller divisions or areas into which India is sub-divided with a view to the comparison of meteorological and crop statistics:—

TABLE I.—Comparison of monthly mean air temperatures in 1898, with the averages of past years.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
BURMA COAST AND BAY ISLANDS.	Port Blair .	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rangoon .	−0.9	+0.1	−0.8	−1.3	−1.8	+0.4	−0.6	+0.8	+1.0	+1.5	+0.9	+1.4	+0.1
	Diamond Island	−0.2	+1.9	+0.3	+0.5	−2.4	+0.3	−0.5	−0.6	+0.2	+1.1	+0.1	−0.7	0
	Cocos Island .	+1.2	+1.3	−0.3	+0.7	−0.4	+1.3	+0.6	+0.8	+0.8	+2.5	+2.4	+0.9	+1.0
	Akyab .	+2.5	+1.2	−0.2	+1.2	−0.2	+0.4	−0.7	+0.6	+0.8	+1.6	+1.5	+1.3	+0.8
ASSAM .	Silchar .	−0.6	+0.4	−1.5	+0.9	+1.6	+0.4	−0.1	−0.4	−0.1	+0.9	−0.1	−0.7	+0.1
	Sibsagar .	+0.6	+0.5	+1.4	+5.3	+3.5	+1.2	+1.5	+0.6	−0.6	+0.8	+0.5	+0.4	+1.3
	Dhubri .	+0.5	−0.8	+1.2	+0.7	−0.3	−0.4	−0.9	−0.7	−1.2	−0.1	−0.7	+2.3	0
	Chittagong	−0.3	−0.3	−0.3	+2.1	+1.2	+0.8	+0.9	+0.5	−1.1	+0.2	−0.2	+0.1	+0.3
BENGAL AND ORISSA.	Narayanganj .	?	+0.6	−1.5	+0.9	+1.8	+0.5	+0.2	0	−0.6	−0.4	−0.9	−0.4	?
	Calcutta (Ali- pore).	0	+0.1	−0.5	+1.9	+1.3	−0.3	−0.2	−0.6	−0.4	+0.6	+0.7	0	+0.2
	Saugor Island .	−1.1	+0.3	−0.4	−0.2	+1.1	−0.2	−0.7	−0.1	−0.3	−1.0	0	+1.2	−0.1
	Burdwan .	−2.0	−0.1	−2.1	−0.2	+1.2	+0.3	+0.1	0	+0.6	−1.0	+0.2	+1.9	−0.1
	Berhampore .	−0.2	+1.1	−0.2	+0.9	+1.9	−1.1	−0.7	−0.5	−0.6	−1.3	0	+1.4	+0.1
	False Point .	−1.0	−0.7	?	?	−0.1	−2.0	−0.3	−0.6	−0.7	−0.7	0	+0.6	?
	Cuttack .	−2.5	−1.3	−2.1	−0.2	+0.5	+0.3	−0.1	−0.5	+0.4	−0.5	+0.3	+2.3	−0.3
GANGETIC PLAIN AND CHOTA NAGPUR.	Hazaribagh .	−2.5	−1.4	+0.3	+0.5	+0.8	+0.6	−0.9	−0.7	+0.9	+0.2	+0.3	+3.1	+0.1
	Patna .	−0.9	−0.8	+1.1	+3.0	+2.9	+0.8	+0.4	−0.5	−0.6	−0.1	+0.8	+1.7	+0.7
	Darbhanga .	+0.8	+0.2	+0.1	+1.9	+0.3	−0.2	−0.1	−0.9	−2.5	−0.7	+0.4	+1.0	0
	Allahabad .	+0.2	+0.4	−0.8	?	?	−0.3	+0.5	+0.4	−2.7	−0.1	−0.4	+0.4	?
	Lucknow .	−0.2	−0.5	−1.9	+2.8	+1.1	−0.3	−0.9	−2.0	−0.9	−0.7	−0.4	+1.5	−0.2
		+2.0	−1.3	+0.3	+3.6	+1.1	−1.7	−1.8	−1.7	−1.5	−0.3	+0.3	+1.6	+0.1

TABLE I.—Comparison of monthly mean air temperatures in 1898, with the averages of past years—contd.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
UPPER SUB-HIMALAYAS.	Dehra Dun .	°	°	°	°	°	°	°	°	°	°	°	°	
	Roorkee .	+1.8	−2.1	+0.4	+3.3	−1.2	−1.0	−1.6	−1.4	−2.2	−0.3	−1.5	−1.4	+0.6
	Meerut .	+1.3	−1.7	−0.5	+2.9	−0.5	+0.1	−1.6	−0.6	−1.3	−0.6	−1.3	−0.5	−0.4
	Lahore .	+2.4	−1.1	−0.5	+3.2	−0.7	+0.8	−0.2	+1.5	−0.8	−0.2	−0.5	+0.8	+0.4
	Ludhiana .	+4.4	+1.3	+1.6	+6.3	+0.9	+4.6	−2.0	+4.3	+2.3	+2.6	+1.4	+1.4	+2.4
INDUS VALLEY AND NORTH-WEST RAJPUTANA.	Jacobabad .	+4.2	+0.8	+1.7	+5.8	+1.7	+4.7	−1.4	+3.1	−0.7	+0.9	+1.0	+0.9	+1.7
	Peshawar .	+3.1	+2.0	−1.2	+4.2	−1.6	+3.2	−1.7	+3.2	−0.4	+0.7	−1.0	−0.4	+0.9
	Mooltan .	+4.8	+2.0	+0.5	+6.1	+1.5	+4.4	?	+3.0	+2.0	+2.3	+0.2	+0.3	?
	Kurrachee .	+3.7	+2.4	−0.1	+4.0	+1.4	+3.9	+0.9	+1.2	+1.8	+2.0	+1.1	−0.7	+1.8
EAST RAJPUTANA, CENTRAL INDIA AND GUJARAT.	Jeypore .	+3.5	+1.5	−1.0	+1.3	+0.5	+0.5	+0.9	+0.2	+0.3	+1.5	+1.2	−0.8	+0.8
	Ajmere .	+2.7	+0.3	+1.2	+4.8	+0.1	+2.6	+0.6	+2.9	+1.3	+2.5	+3.0	+1.0	+1.9
	Deesa .	+3.1	+1.3	+1.2	+4.9	+1.3	+3.2	+2.6	+4.0	+1.4	+2.8	+3.3	+1.9	+2.6
	Nowgong .	+1.9	−1.1	−0.2	+3.0	+0.8	+1.2	+0.3	+1.4	+0.6	+3.0	+4.5	+0.3	+1.3
DECCAN	Agra .	−0.1	+0.5	−0.5	+3.0	+1.2	+0.1	−1.0	−2.3	−1.4	+1.3	?	?	?
	Belgaum .	+3.3	−0.2	+0.4	+3.4	0	+1.6	+0.6	+0.6	+1.0	+2.4	+2.5	+2.2	+1.5
	Sholapur .	+0.8	−2.6	+0.9	+0.2	0	−0.3	0	+0.4	+0.5	+1.5	−0.5	+1.8	+0.2
	Poona .	−1.0	−2.8	+0.9	+1.7	+1.1	+2.0	+0.2	+0.8	−0.1	+1.9	+1.0	+3.9	+0.8
	Akola .	−1.2	−1.2	+1.4	+2.0	+1.5	+0.5	0	−0.7	+0.2	+2.2	+1.4	+3.8	+0.8
	Buldana .	−2.3	−0.6	+2.3	+4.1	+1.5	+1.2	−0.1	−1.4	+0.8	+1.6	+3.0	+6.9	+1.4
	Khandwa .	+0.4	−1.3	+1.5	+3.9	+1.9	+0.9	+0.3	−1.1	−0.1	+1.6	+2.6	+3.8	+1.2
	Hoshangabad .	−1.5	+0.3	+1.7	+5.2	+2.3	+1.1	+0.7	−0.8	+0.2	+1.2	+4.5	+6.1	+1.8
	Nagpur .	−2.0	−0.3	+1.0	+3.7	+2.0	+1.8	+0.2	−1.8	0	+0.2	+2.0	+3.2	+0.8
	Jubbulpore .	−1.4	−1.8	−0.3	+2.1	+0.7	−0.2	−0.3	−1.8	−0.3	+1.0	+2.4	+4.1	+0.4
	Saugor .	−2.8	−0.3	−0.7	+2.7	+1.3	+0.5	−1.3	−2.6	−0.4	0	+2.3	+4.2	+0.2
	Sutna .	+1.1	+0.2	+2.5	+2.8	+2.2	+0.3	−0.4	−1.4	+0.2	+1.6	+3.1	+3.2	+1.3
	Raipur .	−0.1	+1.1	+0.3	+3.9	+1.3	+0.2	−0.7	−2.1	−0.1	+0.4	+2.3	+3.3	+0.8
	Hyderabad (Decan). .	−1.1	−0.4	+1.2	+2.9	+1.0	+0.8	−0.2	−1.6	+0.4	−0.1	+1.4	+4.2	+0.7
	Bombay .	−1.6	−1.9	+1.4	+0.6	+1.2	+2.3	−1.6	+1.3	+1.2	+2.4	+0.5	+3.5	+0.8
WEST COAST	Ratnagiri .	+1.8	+0.5	+0.5	+0.6	+0.8	0	0	+0.6	+0.4	+2.3	+2.0	+1.6	+0.9
	Karwar .	+1.1	−0.3	+0.9	+1.2	+0.9	+1.0	−0.5	+0.8	−0.2	+2.4	+1.3	+1.5	+0.8
	Cochin .	+0.4	−1.6	+0.8	+1.1	+0.9	+0.3	+0.5	+0.9	0	+1.9	+0.3	+0.8	+0.5
	Salem .	+0.7	+1.5	+1.1	+1.2	+0.6	+0.7	+0.3	+1.0	−0.1	+0.3	−0.4	+1.2	+0.7
SOUTH INDIA	Mercara .	0	+1.3	−0.3	+0.1	+0.2	+1.4	+3.0	+2.6	−0.8	+0.1	−1.3	+0.4	+0.6
	Chitaldroog .	+1.3	−0.1	+0.6	+0.9	+0.3	−0.2	+0.2	+0.1	+0.1	+1.1	−1.1	+1.1	+0.4
	Bangalore .	−0.4	−1.3	+0.8	+1.5	+1.1	+0.3	+0.5	+1.7	+0.1	+0.6	−0.5	+1.0	+0.4
	Hassan .	+1.1	+1.0	+0.1	+1.3	+1.9	+0.4	+1.6	+2.2	+0.5	+1.4	−0.6	+0.7	+1.0
	Mysore .	−0.1	−0.3	−0.6	+1.3	+0.6	−0.1	+0.9	+1.3	+0.3	+0.8	−0.8	+0.5	+0.3
		−0.2	+0.8	−0.8	+1.2	+1.2	+0.4	+0.7	+1.0	−1.2	+0.2	−1.4	−0.2	+0.1

TABLE I.—Comparison of monthly mean air temperatures in 1898, with the averages of past years—concl'd.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		°	°	°	°	°	°	°	°	°	°	°	°	°
SOUTH INDIA —concl'd.	Trichinopoly .	+0.2	+2.0	-0.3	+1.6	+1.3	+2.0	+2.1	+2.2	-0.3	+0.3	-1.2	+0.3	+0.9
	Madras .	-1.4	-0.9	-1.9	-0.4	+0.9	+0.3	+0.8	+0.3	-1.6	-0.7	-0.4	+0.7	-0.4
	Bellary .	-0.8	-0.8	-0.6	-0.1	+0.2	+0.3	+0.3	+1.1	-0.6	+0.2	-0.2	+1.9	+0.1
	Cocanada .	-0.6	-1.5	-0.2	+0.4	-1.2	+0.8	-1.3	+0.6	+0.3	+1.1	-0.5	+2.1	0
	Vizagapatam .	-1.4	-2.3	-0.7	-1.0	-0.5	-1.3	-0.7	+0.5	-0.2	+0.3	-1.3	+1.2	-0.6
HILL STATION BALUCHISTAN	Quetta .	+5.1	+2.2	-0.8	+2.0	-0.1	+1.3	+0.3	-0.5	+0.7	+0.2	0	-3.4	+0.6
	Leh .	+5.6	+3.3	+4.3	+5.2	-0.5	+5.2	-0.5	+4.3	+2.3	+2.6	+0.3	-3.3	+2.4
	Srinagar .	+1.0	+6.5	+3.4	+1.9	-4.6	+3.3	-1.3	+4.0	-0.5	+2.4	-0.3	0	+1.3
	Murree .	+4.9	+0.1	+0.3	+7.1	-1.0	+5.3	-1.6	+2.4	-2.1	+2.3	+1.7	-2.6	+1.5
HILL STA- TIONS, NORTHERN INDIA.	Kailang .	+7.8	+1.6	+5.0	+8.5	-1.1	?	?	?	+0.2	+3.4	+2.3	?	?
	Simla (Ridge) .	+3.6	-2.7	+2.0	+3.6	-0.6	-0.1	-1.3	-0.1	-2.1	0	-0.5	-3.7	-0.2
	Chakrata .	+4.5	-2.7	+3.5	+4.5	-1.6	-1.9	-1.7	-0.3	-1.4	+0.3	-0.5	-2.3	0
	Ranikhet .	+3.3	-2.5	+2.9	+4.9	+0.8	0	-0.8	+0.1	-0.9	+0.3	-0.7	-3.0	+0.4
	Katmandu .	-0.4	-0.3	+0.9	+3.7	-0.5	-0.7	-0.5	-0.4	-3.2	+0.2	-1.2	-2.3	-0.4
	Darjeeling .	+2.0	?	?	?	+0.7	+0.8	+0.1	+0.3	+0.1	+2.3	?	-1.0	?
HILL STA- TIONS, CENTRAL INDIA.	Mount Abu .	+5.4	-1.3	+0.7	+4.0	0	-0.2	+0.4	-0.2	+0.1	+2.9	+2.8	-1.4	+1.1
	Pachmarhi .	-1.4	-0.4	+0.6	+3.6	+1.3	+0.8	-0.4	-1.6	0	+0.5	+3.0	+4.0	+0.8
	Chikalda .	+1.4	-1.5	+1.9	+3.4	+1.6	+0.3	+0.1	-1.7	+0.7	+1.5	+3.0	+3.4	+1.2
HILL STATION, SOUTHERN INDIA.	Wellington .	+0.4	+0.9	-0.6	+0.6	+0.1	+0.4	+0.2	+0.2	-0.4	+0.1	+0.2	+0.7	+0.2
EXTRA INDIAN STATIONS.	Muscat .	+2.0	+0.8	-1.6	+1.9	?	?	?	?	?	?	?	?	?
	Aden .	+0.9	+0.2	+0.2	-1.1	+0.9	+0.7	+1.8	+1.4	+0.4	+0.1	0	-0.3	+0.4
	Perim .	+0.8	-0.2	-0.3	-0.9	0	-0.7	-0.5	+0.7	-0.1	+0.4	+0.2	-0.5	-0.1
	Zanzibar .	+1.6	+1.0	+0.6	+3.2	+2.9	+1.0	+0.5	+0.6	+0.7	+0.1	+1.2	+0.9	+1.2
	Port Victoria (Seychelles).	-0.6	-0.2	+1.1	+2.0	+0.5	+0.3	-0.6	-0.6	-1.0	-1.1	-0.1	-0.3	-0.1

TABLE II.—Geographical Summary of the temperature data of Table II in the monthly reviews of 1898.

METEOROLOGICAL PROVINCE.	Number of stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		°	°	°	°	°	°	°	°	°	°	°	°	°
North-West Himalaya	6-7	+4.4	+0.5	+3.1	+5.1	-1.2	+2.0	-1.2	+1.7	-0.6	+1.6	+0.3	-2.5	+1.1
Sikkim Himalaya and Nepal.	1-2	+0.8	-0.3	+0.9	+3.7	+0.1	+0.1	-0.2	-0.1	-1.6	+1.3	-1.2	-1.7	+0.2
Punjab Plains .	3-4	+4.1	+1.5	+0.7	+5.6	+0.6	+4.2	-1.7	+3.4	+0.9	+1.2	+0.4	+0.6	+1.8
Gangetic Plain .	7-8	+1.5	-0.8	-0.3	+3.0	0	-0.1	-0.6	-0.5	-1.4	-0.1	-0.1	+0.7	+0.1
Western Rajputana .	4	+3.6	+0.4	-0.2	+3.1	+0.7	+1.4	+0.6	+0.7	+0.7	+2.4	+2.4	-0.7	+1.3
Eastern Rajputana and Central India.	4-5	+1.3	+0.7	+0.9	+3.9	+1.2	+1.3	+0.2	+0.2	+0.3	+1.7	+2.9	+2.4	+1.4

TABLE II.—*Geographical Summary of the temperature data of Table II in the monthly reviews of 1898—concl'd.*

METEOROLOGICAL PROVINCE.	Number of stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		°	°	°	°	°	°	°	°	°	°	°	°	°
Nerbudda Valley . . .	3	-2.1	-0.1	+0.7	+3.9	+1.9	+1.1	-0.1	-1.7	-0.1	+0.5	+2.9	+4.5	+1.0
Chota Nagpur . . .	1	-0.9	-0.8	+1.1	+3.0	+2.9	+0.8	+0.4	-0.5	-0.6	-0.1	+0.8	+1.7	+0.7
Lower Bengal . . .	4-5	-0.9	+0.1	-0.8	+0.6	+1.1	-0.7	-0.4	-0.4	-0.3	-0.7	+0.2	+1.0	-0.1
Assam and Cachar . .	3	+0.3	-0.2	+0.8	+2.7	+1.5	+0.5	+0.5	+0.1	-1.0	+0.3	-0.1	+0.9	+0.5
Orissa	2	-2.5	-1.4	-0.9	+0.2	+0.7	+0.5	-0.5	-0.6	+0.7	-0.2	+0.3	+2.7	-0.1
Central Provinces South and Berar.	6	-0.7	-1.0	+1.2	+3.3	+1.3	+0.6	-0.1	-1.5	+0.3	+1.0	+2.6	+4.4	+1.0
Konkan	3	+1.1	-0.5	+0.7	+1.0	+0.9	+0.4	0	+0.8	+0.1	+2.2	+1.2	+1.3	+0.8
Malabar Coast . . .	1	+0.7	+1.5	+1.1	+1.2	+0.6	+0.7	+0.3	+1.0	-0.1	+0.3	-0.4	+1.2	+0.7
Deccan, Hyderabad and Mysore.	10	-0.2	-0.9	+0.4	+1.1	+0.9	+0.6	+0.3	+0.9	+0.1	+1.2	-0.2	+1.8	+0.5
East Coast and Car- natic.	5	-0.6	-0.3	-0.7	+0.1	+0.1	+0.6	+0.8	+1.2	-0.5	+0.2	-0.9	+0.9	+0.1
Arakan and Pegu . .	3-4	+0.1	+1.1	-0.8	+0.8	+0.2	+0.6	+0.1	-0.1	+0.1	+1.0	+0.4	-0.2	+0.3
Bay Islands	2	+0.8	+0.7	-0.5	-0.1	-1.0	+0.4	-0.7	+0.7	+0.9	+1.6	+1.2	+1.4	+0.5
Extra-Tropical India .	41-44	+1.5	+0.1	+0.6	+3.4	+0.5	+1.0	-0.4	+0.4	-0.3	+0.8	+0.8	+0.6	+0.8
Tropical India . . .	31-32	-0.1	-0.3	+0.2	+1.2	+0.6	+0.6	+0.2	+0.3	+0.1	+1.1	+0.5	+1.8	+0.5
Whole India	73-76	+0.8	-0.1	+0.5	+2.5	+0.6	+0.8	-0.1	+0.3	-0.2	+0.9	+0.7	+1.1	+0.7

TABLE III(a).—*Variations of the mean monthly maximum temperature from the normal in 1898 in the eleven meteorological provinces of India.*

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
	°	°	°	°	°	°	°	°	°	°	°	°	°
Burma Coast and Bay Islands	-0.8	+0.4	-0.3	+0.3	-1.4	+0.9	-0.1	-0.4	+0.9	+2.0	+1.6	+1.1	+0.4
Burma Inland	+0.4	+0.5	+2.0	+2.3	+0.1	+1.3	+0.4	-1.0	-2.0	+0.1	+2.5	+2.2	+0.7
Assam	+1.2	-0.2	+2.9	+3.1	+2.1	+1.7	+0.1	+0.2	-2.0	-0.1	+0.4	+0.6	+0.8
Bengal and Orissa . .	-0.3	-0.7	+1.2	+0.7	+2.3	-0.2	+0.1	-0.3	-0.8	-0.6	+0.7	+0.9	+0.3
Gangetic Plain and Chota Nagpur.	+1.5	-1.5	+0.3	+2.6	+2.8	-0.7	-0.2	-1.6	-1.3	+0.3	+1.9	+1.7	+0.5
Upper Sub-Himalayas . .	+3.6	-1.8	-0.4	+4.2	+0.1	+1.4	-1.8	+1.7	-0.9	+1.4	+0.7	-1.2	+0.6
Indus Valley and North-West Rajputana.	+5.2	+1.2	-0.7	+5.0	+0.2	+2.8	-0.6	+2.7	+0.8	+2.4	+1.8	-0.5	+1.7
East Rajputana, Central India and Gujarat.	+4.0	-0.7	+0.5	+3.8	+0.9	+1.4	+1.5	+1.0	+1.1	+3.9	+4.0	-0.5	+1.7
Deccan	+1.0	-2.3	+0.9	+2.3	+1.7	+1.3	-0.2	-1.8	+0.5	+2.5	+3.2	+4.1	+1.1
West Coast	+2.3	-0.8	+1.0	+0.9	+1.1	+0.8	+0.4	+1.4	-0.1	+1.9	+0.4	+0.7	+0.8
South India	+0.4	-0.9	+0.4	+0.2	+1.7	+0.8	+1.5	+2.2	-0.9	+0.6	-0.7	+0.7	+0.5

TABLE III (b).—Variations of the mean monthly minimum temperature from the normal in 1898, in the eleven meteorological provinces of India.

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
Burma Coast and Bay Islands.	•	•	•	•	•	•	•	•	•	•	•	•	•
Burma Inland	+0.7	+1.9	-0.2	+1.1	+0.5	+0.8	+0.5	+0.5	+0.7	+1.1	-1.1	-1.2	+0.4
Assam	+1.7	+1.5	-1.7	+2.7	+0.3	+1.1	+0.5	+0.4	-0.2	+0.7	-1.6	+1.9	+0.6
Bengal and Orissa . . .	-1.3	+1.1	-2.2	+2.0	+0.5	+0.4	+0.1	+0.2	-0.6	-0.4	-1.0	+0.4	-0.1
Gangetic Plain and Chota Nagpur.	-1.9	+0.8	-3.3	+1.6	+0.6	+0.1	+0.2	+0.4	0	-0.4	-0.1	+0.8	-0.1
Upper Sub-Himalayas . .	-1.3	+1.3	-1.7	+2.0	+0.9	0	+0.3	0	-0.6	-1.0	+0.2	+2.3	+0.2
Indus Valley and North-West Rajputana.	+0.7	+1.8	-0.6	+2.9	+0.2	+3.4	-0.4	+1.8	-0.2	-0.2	+0.1	+1.9	+1.0
East Rajputana, Central India and Gujarat.	+1.5	+1.6	-0.8	+2.4	+0.9	+2.5	+0.6	+1.5	+1.3	-0.6	+0.5	-0.8	+0.9
Deccan	-0.9	+1.7	-0.7	+2.8	+1.1	+1.8	+0.9	+0.9	+0.6	-0.4	+4.2	+4.1	+1.3
West Coast	-3.9	0	+0.2	+2.5	+2.0	+1.2	+0.1	-0.2	+0.5	-1.1	+1.3	+5.8	+0.7
South India	-0.5	+0.4	+0.4	+1.5	+0.8	+1.0	+0.4	+0.8	+0.4	+1.5	+0.8	+1.8	+0.8
	-0.9	+0.6	-1.9	+0.6	+0.6	+0.6	+1.0	+0.8	+0.2	+0.9	+0.4	+1.5	+0.4

TABLE III (c).—Variations of the mean monthly temperature from the normal in 1898, in the eleven meteorological provinces of India.

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
Burma Coast and Bay Islands	•	•	•	•	•	•	•	•	•	•	•	•	•
Burma Inland	0	+1.2	-0.2	+0.8	-0.5	+0.9	+0.2	+0.1	+0.8	+1.6	+0.2	-0.1	+0.4
Assam	+1.1	+1.0	+0.2	+2.5	+0.2	+1.2	+0.5	-0.4	-1.1	+0.4	+0.5	+2.1	+0.7
Bengal and Orissa . . .	0	+0.5	+0.4	+2.6	+1.3	+1.1	+0.1	+0.2	-1.3	-0.2	-0.3	+0.5	+0.4
Gangetic Plain and Chota Nagpur.	-1.1	+0.1	-1.0	+1.2	+1.5	0	+0.1	-0.1	-0.4	-0.5	+0.3	+0.9	+0.1
Upper Sub-Himalayas . .	+0.2	-0.1	-0.7	+2.3	+1.9	-0.4	0	-0.8	-1.0	-0.4	+1.1	+2.1	+0.4
Indus Valley and North-West Rajputana.	+2.2	0	-0.4	+3.6	+0.1	+2.4	-1.1	+1.8	-0.6	+0.6	+0.4	+0.3	+0.8
East Rajputana, Central India and Gujarat.	+3.4	+1.4	-0.8	+3.7	+0.6	+2.7	0	+2.1	+1.1	+0.9	+1.2	-0.7	+1.3
Deccan	+1.6	+0.5	-0.1	+3.3	+1.0	+1.6	+1.2	+0.9	+0.9	+1.8	+4.2	+1.8	+1.6
West Coast	-1.4	-1.2	+0.6	+2.4	+1.9	+1.3	0	-1.0	+0.5	+0.7	+2.3	+4.9	+0.9
South India	+0.9	-0.2	+0.7	+1.2	+0.9	+0.9	+0.4	+1.1	+0.2	+1.7	+0.6	+1.3	+0.8
	-0.2	-0.1	-0.7	+0.4	+1.1	+0.7	+1.3	+1.5	-0.4	+0.8	-0.2	+1.1	+0.4

TABLE IV.—Variations of the mean monthly and annual temperatures from the normal in 1898, in 54 of the 57 meteorological districts or divisions of India.

PROVINCE.	DIVISION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
BURMA	1. Tenasserim	•	•	•	•	•	•	•	•	•	•	•	•	•
	2. Lower Burma, Deltaic.	-0.8	+0.9	+0.1	+0.7	-1.0	+0.7	+0.3	+0.4	+1.3	+1.6	+0.4	-0.7	+0.3
	3. Central do.	+0.7	+1.5	-0.3	+0.8	-0.7	+0.5	+0.3	-0.1	+0.6	+1.7	+0.2	+0.4	+0.5
	4. Upper do.	+0.5	+1.2	+0.1	+1.4	-1.1	+1.8	+0.5	-0.4	+0.5	+1.7	+0.7	+1.2	+0.7
	5. Arakan	+1.2	+1.1	+0.3	+2.8	+0.7	+1.1	+0.4	-0.4	-1.4	+0.2	+0.5	+2.2	+0.7
		-0.7	+0.1	-1.8	+1.0	+1.6	+1.0	-0.1	0	-0.2	+0.6	-0.5	-1.2	0

TABLE IV.—Variations of the mean monthly and annual temperatures from the normal in 1898, in 54 of the 57 meteorological districts or divisions of India—contd.

PROVINCE	DIVISION	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
BENGAL, AND ASSAM	6. Eastern Bengal . .	−0.6	+0.7	−0.8	+1.8	+1.8	+0.3	+0.4	−0.1	−0.6	−0.4	+0.2	−0.4	+0.2
	7. Assam Surma . .	+0.5	+0.9	+1.1	+5.3	+3.6	+1.3	+1.4	+0.3	−0.8	+0.2	+0.4	−0.2	+1.2
	9. Do. Brahmaputra . .	−0.3	0	−0.1	+1.2	+0.2	+0.9	−0.6	+0.1	−1.6	−0.5	−0.7	+0.8	−0.8
	10. Deltaic Bengal . .	−1.7	−0.1	−1.7	+0.3	+1.6	−0.4	−0.4	−0.1	+0.2	−1.1	+0.1	+0.9	−0.2
	11. Central do. . .	−0.4	+0.3	−1.2	+2.2	+1.9	−0.9	+0.3	+0.1	−0.5	−0.6	+0.6	+1.0	+0.2
	12. North do. . .	−0.2	+1.0	−1.2	+2.2	+1.0	+0.7	+0.8	+1.3	−1.8	0	+0.2	+0.1	+0.3
	13. Bengal Hills . .	+2.0	?	−1.8	?	+1.5	+1.3	−0.2	+0.7	−0.4	+1.6	?	−1.2	?
	14. Orissa . .	−2.3	−1.9	−0.9	−0.2	+1.2	+0.2	−0.3	−0.3	+0.6	−0.3	+0.6	+3.1	0
	15. Chota Nagpur . .	−1.0	0	+0.5	+2.1	+2.8	−0.3	+0.2	−0.2	+0.1	−0.6	+1.1	+2.9	+0.6
	16. South Bihar . .	+0.4	0	−0.9	+2.2	+1.9	+0.1	+0.9	−1.0	−1.7	−0.8	+1.3	+1.9	+0.4
	17. North do. . .	+0.6	+0.4	−1.0	+1.5	+0.6	0	+0.7	+0.5	−2.1	−0.2	+0.5	+0.7	+0.2
N.-W. PROVINCES AND OUDH.	18. North-Western Provinces, East.	−0.1	−0.4	−2.1	+2.0	+0.9	−0.9	−0.8	−2.0	−1.1	−0.1	+1.0	+2.3	−0.1
	19. South Oudh . .	+1.8	−0.2	0	+3.6	+2.1	−0.9	−0.6	−1.2	−1.0	+0.2	+1.5	+2.2	+0.6
	21. North-Western Provinces, Central.	+1.4	+0.6	+0.6	+3.8	+1.2	+1.3	−0.5	−1.1	−0.9	+0.2	+2.4	+2.1	+0.9
	22. Do. do. West	+2.1	−0.3	−1.4	+2.3	−0.4	+1.2	+0.2	+1.2	+0.1	+0.8	+1.5	+1.6	+0.7
	23. Do. do. East Submontane.	?	−0.6	−1.5	+1.1	+1.5	?	?	?	?	?	?	+0.9	?
	24. Do. do. West do.	+2.3	−0.7	+1.0	+2.1	0	−0.5	−0.7	−0.6	−1.0	0	+0.1	+0.5	+0.2
	25. Do. do. Hills . .	+4.5	−1.8	+3.0	+4.3	+0.8	−0.5	−0.6	+0.1	−1.0	+0.8	−0.2	−2.3	+0.6
PUNJAB . .	26. South-East Punjab . .	+1.3	−1.6	−0.5	+2.4	−0.2	+1.5	+0.1	+1.8	+1.1	+0.7	+0.4	−0.3	+0.6
	27. South do. . .	+2.8	−0.2	−1.2	?	−0.2	+3.1	−0.4	+3.8	+2.7	+0.8	+0.6	−0.8	?
	28. Central do. . .	?	+1.4	+0.1	+4.8	+0.8	+3.9	−2.3	+3.9	?	+1.5	?	+0.5	?
	29. Punjab Submontane . .	+2.5	+0.6	+0.4	+5.1	+0.5	+4.4	−2.5	+3.4	−1.3	+0.9	+0.5	+0.4	+1.2
	30. Do. Hills . .	+3.8	−0.2	+1.2	+4.6	−0.4	+3.0	−1.6	+1.8	−2.1	+0.8	+0.3	−3.6	+0.6
	31. North Punjab . .	+2.3	+1.7	−1.0	+5.2	−0.4	+5.4	−1.9	+2.7	−1.0	+0.9	+0.5	+0.3	+1.2
	32. West do. . .	+3.1	+1.5	+0.1	+5.7	+0.7	+3.0	−0.8	+2.8	+1.0	+1.2	+0.2	−0.6	+1.5
BOMBAY AND MALABAR COAST DISTRICT (MADRAS).	33. Malabar . .	+0.8	+0.1	+0.7	+1.1	+0.9	+0.8	+0.4	+1.2	+0.1	+1.0	−0.3	+0.5	+0.6
	34. Madras, South-Central	−0.1	+1.2	−0.8	+0.2	+0.7	+1.7	+2.2	+2.5	−0.1	+0.6	−1.1	−0.2	+0.6
	35. Coorg . .	−1.3	−0.1	+0.7	+1.1	+0.1	+0.3	+0.4	0	+0.1	+1.3	−0.1	+1.1	+0.3
	36. Mysore . .	+1.1	+1.1	0	+0.9	+1.1	+0.3	+1.1	+1.7	0	+1.5	−0.1	+0.5	+0.8
	37. Konkan . .	+1.1	−0.5	+0.7	+1.3	+1.0	+1.0	+0.5	+1.0	+0.2	+2.4	+1.5	+1.8	+1.0
	38. Bombay Deccan . .	−0.7	−2.5	+0.8	+1.4	+1.7	+1.6	+0.3	+0.2	+0.4	+1.9	+1.0	+3.5	+0.8
	40. Khandesh . .	−1.8	−0.8	+0.8	+3.4	+1.7	+1.2	+0.6	−0.6	+0.3	+1.6	+3.5	+5.5	+1.3

TABLE IV.—Variations of the mean monthly and annual temperatures from the normal in 1898, in 54 of the 57 meteorological districts or divisions of India—concl'd.

PROVINCE.	DIVISION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
		°	°	°		°	°	°	°	°	°	°	°	°
CENTRAL PROVINCES AND BERAR.	41. Berar	-2.3	-1.1	+2.0	+4.2	+2.3	+0.9	+0.2	-1.6	+0.9	+1.5	+3.6	+7.1	+1.5
	42. Central Provinces West	-1.7	+0.2	+1.2	+4.4	+2.4	+1.4	+0.7	-1.6	+0.3	+0.8	+3.7	+5.7	+2.5
	43. Do. Central.	-2.6	-1.2	-0.1	+1.9	+1.4	+0.5	-0.8	-2.0	+0.2	-0.5	+2.9	+4.9	+0.4
	44. Do. East .	-1.3	-1.0	-0.2	+1.5	+1.4	+1.5	-0.4	-1.8	+0.3	-0.7	+0.8	+4.4	+0.4
BOMBAY (NORTH)	45. Gujarat	?	?	?	+1.8	?	?	?	?	?	?	+4.3	+3.6	
	46. Kathiawar and Cutch.	+2.7	+0.9	-1.3	+2.2	+0.3	+0.5	+1.0	+1.2	-0.2	+1.7	+4.8	+0.1	+1.2
	47. Sind	+3.4	+1.6	-1.2	+2.6	+0.5	+1.9	+0.7	+0.4	+1.0	+0.9	+1.8	-0.8	+1.1
RAJPUTANA AND CENTRAL INDIA.	48. Baluchistan Hills .	+5.1	+2.4	-1.3	+1.9	-0.1	+1.2	+0.3	-1.5	+0.3	-0.2	+1.4	-2.9	+0.6
	49. Central India East .	+2.2	+0.7	-0.2	+3.6	+1.5	+0.9	+0.5	-1.5	+0.5	+1.1	+4.0	+3.4	+1.4
	50. Rajputana East, Central India West.	+2.2	+0.6	+0.4	+4.1	+0.9	+2.6	+2.2	+3.2	+1.9	+2.0	+4.3	+1.4	+2.2
	51. West Rajputana .	+4.6	+0.5	-0.4	+4.0	+2.0	+3.6	+2.8	+4.4	+2.9	+1.2	+1.8	-1.2	+2.2
MADRAS	52. East Coast North .	+0.3	-1.8	-1.2	+0.6	?	-0.5	-0.6	+0.7	+0.8	+1.0	-0.3	+2.1	?
	53. Hyderabad South .	-1.3	-2.1	+0.5	+0.8	+2.8	+2.5	-0.1	+0.9	+1.2	+2.6	+1.2	+4.6	+1.1
	54. Madras Central .	-1.1	-1.0	-1.1	+0.1	+0.7	+0.8	+0.9	+2.0	-0.3	+1.7	+0.9	+2.0	+0.5
	55. East Coast Central .	-0.5	-0.5	-0.9	+0.2	+2.6	-0.9	-0.5	+0.4	-0.7	+0.7	-0.2	+1.7	+0.1
	56. East Coast South .	-0.7	-0.2	-0.7	+0.6	+1.4	+1.5	+2.2	+1.5	-0.9	-0.2	-0.4	+0.8	+0.4
	57. Madras South .	-0.5	+0.8	-1.3	?	+0.5	?	?	+0.7	?	-1.0	-1.0	-0.3	?

In the discussion of the meteorology of India during the year 1898, the year is divided into four seasons according to the following arrangement :—

- 1st.—The cold weather period, including the months of January and February.
- 2nd.—The hot weather period, including the months of March, April and May.
- 3rd.—The period of the south-west monsoon rains proper, including the months of June, July, August and September.
- 4th.—The period of the retreating south-west monsoon, including the months of October, November and December.

The following give a resumé of the chief features of the temperature conditions during the year :—

I.—The cold weather period.—Weather was less disturbed than usual throughout the season. One cold weather storm of moderate intensity crossed Northern India in January. It apparently formed in Persia at the end of December, passed through Baluchistan on the 1st of January, Sind on the 2nd, Central Rajputana on the 3rd and Bihar and Chota Nagpur on the 4th and filled up in Bengal and Upper

Assam on the 5th. A secondary depression gave stormy weather in the Punjab, more especially in the hill districts on the 3rd and 4th. Heavy snow fell in the Punjab and Kashmir Himalayas, and moderate snow in the Afghan and Baluch mountain districts. The storm was preceded by a well-defined warm wave, and followed by a cool wave in Northern India. A feeble depression gave warm cloudy weather in North-Western India from the 23rd to the 25th.

Four cold weather storms of slight intensity affected Northern India in February. The first originated in Persia on the 27th of January and passed into Sind on the 31st. It thence drifted eastwards into Bengal and Assam during the next four days. It gave light to moderate snow in the Kashmir and Punjab Himalayas on the 1st and 2nd and light local showers in the north-western and submontane districts of the Punjab. The second storm was initiated in Upper India on the 3rd and advanced rapidly across Northern India between the 4th and 6th. The storm gave numerous thundershowers in the Gangetic Plain, North Bengal and Assam. The third depression formed in North Bombay and South-West Rajputana on the 8th and 9th. It advanced rapidly north-eastwards into North Rajputana and the South Punjab during the next

three days. The disturbance gave moderate to heavy rain accompanying thunderstorms over nearly the whole of Northern and Central India and the North Deccan. Snow fell down to 3,500 feet in Chamba. The fourth depression of the month also originated in Sind, and advanced between the 15th and 18th across Northern India. It gave light rain in the Punjab, and light to moderate snow in the Punjab and Kashmir Himalayas. The warm and cool waves accompanying the storms in February were, with one exception, feebly marked.

The snowfall of the period was much lighter than usual in Baluchistan and Afghanistan, and in the Kashmir and Punjab Himalayas. The precipitation was more or less above the normal, generally in Northern and Central India.

The temperature conditions of the period were directly related to the chief abnormal features of the period, which were—

(1) Fewer cold weather storms than usual, more especially in January. The storms were also of feebler intensity than usual.

(2) The warm and cool waves accompanying the storms were, with one exception, feeble, and hence exercised little influence on the mean temperature conditions of the period.

The following gives a summary of the chief features of these conditions :—

(1) The mean maximum or day temperature was generally in excess in January and in defect in February. The excess was large in January in North-Western India and Baluchistan, where it ranged from 4° to 9°. The deficiency was moderate to considerable in amount in the Deccan and the Central and North-Western Provinces. The day temperature was during January in slight to considerable excess in the Indus valley, and in large excess in Baluchistan. The following gives comparative data for the various provinces :—

AREA.	VARIATION OF MEAN MAXIMUM TEMPERATURE FROM NORMAL IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
Baluchistan (Quetta)	+8.7	+5.3	+7.0
Sind	+4.9	+2.1	+3.5
Punjab	+4.0	—1.0	+1.5
North-Western Provinces and Oudh	+3.7	—2.1	+0.8
Bihar	+1.2	—1.5	—0.2
Chota Nagpur	+0.4	—0.7	—0.2
Bengal	—0.2	—0.6	—0.4
Assam	+1.4	—0.2	+0.6

AREA.	VARIATION OF MEAN MAXIMUM TEMPERATURE FROM NORMAL IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
Burma	—0.5	+0.4	—0.1
Rajputana	+6.1	—0.5	+2.8
Central India	+2.2	—0.9	+0.7
Berar	+1.6	—2.0	—0.2
Central Provinces	+0.5	—2.1	—0.8
Deccan	+1.1	—2.5	—0.7
West Coast	+2.3	—0.8	+0.8
Madras Coast	+0.4	—1.2	—0.4

The chief feature of the period was the large excess in the day temperature over Baluchistan, Sind and the West Punjab.

(2) The mean minimum or night temperature was in defect over the greater part of India in January and in defect in the Deccan and Madras Coast districts also in February. It was throughout the period above the normal in Upper India. The following gives comparative data for the various provinces :—

AREA.	VARIATION OF MEAN MINIMUM TEMPERATURE FROM NORMAL IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
Baluchistan (Quetta)	+1.4	—0.6	+0.4
Punjab	+0.8	+2.1	+1.5
North-Western Provinces and Oudh	—0.7	+1.6	+0.5
Bihar	—0.3	+1.9	+0.8
Chota Nagpur	—2.3	+0.7	—0.8
Bengal	—1.2	+1.5	+0.2
Assam	—1.2	+1.1	—0.1
Burma	+0.8	+1.5	+1.2
Rajputana	+0.7	+1.5	+1.1
Central India	—2.1	+2.2	+0.1
Berar	—6.2	—0.1	—3.2
Central Provinces	—4.2	+0.7	—1.8
Deccan	—3.3	—0.9	—1.2
West Coast	—0.5	+0.4	—0.1
Madras Coast	—1.7	—1.1	—1.4

(3) The mean temperature was above the normal in both months, and hence also on the mean of the period, over the whole Indian area, except Chota Nagpur, the Central Provinces, Berar, the Deccan and the Madras coast. The following gives comparative data for the various provinces :—

AREA.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
	°	°	°
Baluchistan (Quetta)	+5'1	+2'4	+3'8
Punjab	+2'4	+0'6	+1'5
North-Western Provinces and Oudh	+1'5	—0'3	+0'6
Bihar	+0'5	+0'2	+0'4
Chota Nagpur	—1'0	0	—0'5
Bengal	—0'7	+0'5	—0'1
Assam	+0'1	+0'5	+0'3
Burma	+0'2	+1'0	+0'6
Sind	+3'4	+1'6	+2'5
Rajputana	+3'4	+0'5	+2'0
Central India	+0'1	+0'7	+0'4
Berar	—2'3	—1'1	—1'7
Central Provinces	—1'9	—0'7	—1'3
Deccan	—1'1	—1'7	—1'4
West Coast	+0'9	—0'2	+0'4
Madras Coast	—0'6	—1'2	—0'9

The excess was moderate to considerable in amount in Baluchistan, Sind, Rajputana and the South-West Punjab.

The excess was absolutely greatest in the areas represented by the stations for which comparative data are given below :—

STATION.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
	°	°	°
Quetta	+5'1	+2'4	+3'8
Kalat	+6'1	+1'0	+3'6
Jacobabad	+3'6	+2'7	+3'2
Mooltan	?	+2'1	?
Muscat	+1'9	+0'7	+1'3

The following gives comparative data for stations in the Deccan where temperature was most largely below the normal. The deficiency was chiefly due to unusually low night temperature :—

STATION.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
	°	°	°
Sholapur	—1'0	—3'0	—2'0
Chanda	?	—2'6	?
Poona	—1'9	—1'9	—1'9
Hyderabad (Deccan)	—1'7	—2'4	—2'1
Kurnool	—1'6	—1'7	—1'7

Temperature was in considerable excess at the hill stations in North-Western India in January, and generally in slight to moderate defect in February. The following gives data for six representative stations :—

STATION.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN		
	January 1898.	February 1898.	Cold weather period, January and February 1898.
	°	°	°
Leh	+3'4	+1'5	+2'5
Srinagar	+1'0	+6'5	+3'8
Murree	+4'0	—0'1	+2'0
Simla	+4'0	—1'8	+1'1
Ranikhet	+3'8	—1'9	+1'0
Darjeeling	+2'1	?	?

In consequence of the slight intensity of the cold weather depressions there were fewer well marked warm and cool waves in Northern India than usual. The following gives a brief account of the four most important waves during the cold weather and the month of March 1898.

(1) *Warm and cool waves of the period 3rd to the 7th January.*

The warm wave was as usual in front of a cold weather storm and preceded it in its march across Northern India. The wave was in Baluchistan on the 1st, Sind and West Rajputana on the 2nd and 3rd, Central India and the North-Western Provinces on the 4th, the eastern districts of the North-Western Provinces, Bihar and West Bengal on the 5th and Upper Burma on the 6th.

The cool wave followed the storm, but the low temperature accompanying its advance was in part due to strongly marked anticyclonic conditions with great cold in South-Eastern Russia and the Black Sea. It advanced across Persia on the 1st, 2nd and 3rd and affected Baluchistan on the 4th and 5th, Central India and Rajputana on the 6th and 7th, Central India, the North-Western Provinces and the Central Provinces on the 7th and 8th, and Bihar and Bengal on the 9th.

The following table gives the greatest positive and negative variations of temperature from the normal at ten representative stations in the Persian area and Northern India :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE PRECEDING 8 A.M. OF DATE.				Total range of variation during period.
	Greatest excess.	Date.	Greatest defect.	Date.	
Baghdad . . .	+2°8	26th December 1897.	−22°6	4th January 1898.	25°4
Bushire . . .	+0°7	31st December 1897.	−11°8	4th January	12°5
Ispahan . . .	−1°4	1st January 1898.	−18°5	3rd January	17°1
Quetta . . .	+2°2	2nd January	−14°9	4th January	17°1
Jacobabad . . .	+8°7	3rd January	−4°9	5th January	13°6
Hyderabad . . .	+9°0	3rd January	−6°4	6th January	15°4
Jhansi . . .	+7°6	4th January	−4°1	6th January	11°7
Hazaribagh . . .	+3°6	5th January	−6°9	7th January	10°5
Patna . . .	+3°1	5th January	−3°8	7th January	6°9
Calcutta . . .	+2°5	6th January	−5°2	8th January	7°7

The lowest night temperatures of the period and also of the year were registered at the great majority of stations in Northern and Central India during the passage of the cool wave described above.

The following gives the lowest temperatures of the year recorded at a number of stations and also the lowest at the same stations in previous years for comparison :—

STATION.	Lowest minimum temperature recorded in January 1898.	Date on which recorded.	Lowest minimum temperature recorded in January previous to 1898.	Year in which recorded.
Baghdad . . .	26°7	4th January	24°0	1894
Ispahan . . .	−4°0	2nd and 3rd Jan.	11°3	1897
Kabul . . .	0°4	5th "	−0°2	1897
Para Chinar . . .	21°3	4th "	?	?
Kalat . . .	7°4	5th "	−6°4	1897
Peshawar . . .	32°4	8th "	28°8	1878 & 1885

STATION.	Lowest minimum temperature recorded in January 1898.	Date on which recorded.	Lowest minimum temperature recorded in January previous to 1898.	Year in which recorded.
Rawalpindi . . .	31°9	7th and 8th Jan.	24°9	1879
Dera Ismail Khan . . .	33°5	8th "	26°0	1876
Jacobabad . . .	33°5	5th "	30°3	1885
Pachpadra . . .	34°0	6th "	30°0?	1895
Umballa . . .	33°5	8th "	34°0	1896
Roorkee . . .	33°8	7th and 8th "	30°7	1896
Ajmere . . .	34°0	6th and 7th "	31°0	1867
Jeypore . . .	37°2	6th "	35°0	1888
Cawnpore . . .	36°5	8th "	38°0	1897
Lucknow . . .	37°6	9th "	30°0	1874
Allahabad . . .	38°9	9th "	36°0	1878
Arrah . . .	40°3	9th "	40°5	1893

(2) Warm and cool waves of the period 17th to the 23rd February.—These waves accompanied the passage eastwards across Northern India of a cold weather storm, which gave moderate rain in the Punjab and heavy snow over the Punjab and Kashmir Himalayas and Chitral.

The warm wave passed through Baluchistan on the 16th. It was transferred to Rajputana and Central India on the 17th, the North-Western Provinces, Bihar, Bundelkhand and Baghelkhand on the 18th, Bengal on the 19th and Upper and Central Burma on the 20th.

The reduction of temperature due to the cool wave was greatest on the 19th in Baluchistan, on the 20th in the Punjab, Rajputana, Central India, the Central Provinces and North-Western Provinces, on the 21st in Bihar and Chota Nagpur and on the 22nd in Bengal.

The following table giving the greatest excess and deficiency of the mean daily temperature due to the passage of the wave at seven representative stations in Northern India, illustrates the amount of the reduction of temperature accompanying the march of the storm :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE PRECEDING 8 A.M. OF DATE.				Total range of variation during period.
	Greatest excess.	Date.	Greatest defect.	Date.	
Baghdad . . .	+5°7	11th February.	−13°0	17th February	18°7
Bushire . . .	+8°3	13th "	−7°2	18th "	15°5
Quetta . . .	+7°7	16th "	−5°5	19th "	13°2
Hyderabad (Sind). . .	+7°7	17th "	−5°6	19th "	13°3
Sutna . . .	+8°7	18th "	−6°5	21st "	15°2
Burdwan . . .	+8°1	19th "	−8°3	21st "	16°4
Mandalay . . .	+4°8	20th "	−2°5	23rd "	7°3

(1) *Warm and cool waves of the 28th February to the 4th of March.*—These waves preceded and followed a cold weather storm of moderate intensity. This storm formed in Persia on the 25th and 26th, and advanced eastwards from Baluchistan on the 28th to Bengal and Upper Burma on the 3rd and 4th. The increase of temperature in front of the storm was very marked on the 1st in Central India, where temperature averaged 7° above the normal, and in Rajputana, where temperature was 6½° in excess. The cool wave was of exceptional intensity. The reduction of temperature due to the cool wave was greatest on the 2nd in Baluchistan and Sind, on the 3rd and 4th in Rajputana, Central India and the North-Western and Central Provinces, and on the 5th in Bihar, Chota Nagpur, the Central Provinces and Bengal. The following gives data illustrating the changes of temperature due to the passage of these two waves :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE PRECEDING 8 A.M. OF DATE.				Total range of variation during period.
	Greatest excess.	Date.	Greatest defect.	Date.	
	°		°		°
Baghdad	+6.5	24th February	— 9.2	1st March	15.7
Bushire	+5.3	„ „	— 7.4	„ „	12.7
Ispahan	+6.8	„ „	—29.4	„ „	36.2
Teheran	+7.8	„ „	—26.0	„ „	33.8
Quetta	+7.0	27th „	—27.2	2nd „	34.2
Jacobabad	+2.1	„ „	—17.9	„ „	20.0
Ajmere	+8.6	1st March	—18.4	3rd „	27.0
Sutna	+8.9	2nd „	—14.8	4th „	23.7
Sambalpur	+5.2	3rd „	—11.0	5th „	16.2
Chaibassa	+5.2	„ „	— 9.4	„ „	14.6
Bhamo	+4.9	4th „	— 4.8	8th „	9.7
Mandalay	+4.4	„ „	— 4.8	7th „	9.2

(2) *Warm and cool waves of the 18th to the 24th March.*—These waves were of moderate intensity and accompanied a cold weather storm which advanced across Northern India between the 20th and 23rd. The greatest deficiency of temperature due to this cool wave occurred in Baluchistan on the 19th and 20th, the Punjab and Sind on the 21st, Rajputana and the North-Western Provinces on the 22nd, and Bengal on the 23rd. The following data illustrate the large reduction of temperature, which occurred during this period :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE PRECEDING 8 A.M. OF DATE.				Total range of variation during period.
	Greatest excess.	Date.	Greatest defect.	Date.	
	°		°		°
Ispahan	+1.3	15th Mar.	—6.9	18th Mar.	8.2
Bushire	+8.0	„ „	—10.6	„ „	18.6
Quetta	+4.4	16th „	—12.0	20th „	16.4
Jacobabad	+1.8	17th „	—9.4	21st „	11.2
Sambhar	+8.6	18th „	—6.6	22nd „	15.2
Montgomery	+9.5	„ „	—8.9	21st „	18.4
Jhansi	+8.5	19th „	—5.7	22nd „	14.2
Delhi	+7.8	„ „	—7.7?	„ „	15.5
Patna	+6.4	20th „	—5.7	„ „	12.1
Gaya	+6.3	„ „	—7.5	23rd „	13.8
Sibsagar	+5.8	21st „	—6.8	„ „	12.6
Silchar	+5.3	„ „	?	?	?
Bhamo	+6.3	22nd „	—4.2	24th „	10.5
Mandalay	+6.3	„ „	—4.2	25th „	10.5

II.—The hot weather period.—The whole period was drier and hotter than usual. Four depressions formed in Persia in March and advanced eastwards through Baluchistan into India. They, however, decreased in intensity as they marched eastwards, and were of practically no importance in India and gave very little rain. The mean temperature of the month varied only slightly from the normal, but was generally in defect. April was less disturbed than usual, and was considerably hotter and drier than usual over the whole of India. Temperature was in moderate excess in the Peninsula, and in moderate to large excess in Northern India.

May was, on the other hand, more disturbed than usual. A cyclonic storm formed in the Andaman Sea, and advanced by a curved path to the North Arakan Coast. Moderate to heavy rain fell during the storm and for some days afterwards in Burma. This reduced temperature locally below the normal. A disturbance in Upper India in the second week of the month gave general and moderately heavy snow in the higher ranges of the Western Himalayas. This was followed by a cool period in North-Western India. Weather was less disturbed than usual by series of thunderstorms over North-Eastern India, and hence the rainfall of the month was more or less considerably below the normal, more especially in the Assam Valley, Cachar and North and East Bengal. Temperature was hence on the mean of the month generally above the normal, but the excess was not so marked as in the preceding month.

The following gives a summary of the more important temperature conditions of the period :—

(1) The maximum or day temperature was in slight to moderate defect in Baluchistan, the Punjab, Sind, the North-Western Provinces and Bihar in March, and in slight to moderate defect in the Punjab and Burma in May. With these exceptions it was in excess throughout the whole period, more especially in Central and North-Eastern India and the north of the Peninsula. On the mean of the period it was in slight excess in the Peninsula, and in moderate to considerable excess in Northern and Central India.

The following gives comparative data :—

AREA.	VARIATION OF MEAN MAXIMUM TEMPERATURE FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Hot weather period, March to May 1898.

Asiatic Turkey (Baghdad)	—6'2	+4'7	+3'1	+0'5
Persia (Bushire)	—2'6	—2'7	—1'7	—2'3
Baluchistan (Quetta)	—1'5	+5'1	0	+1'2
Punjab	—0'8	+5'3	—0'4	+1'2
Sind	—0'8	+3'8	0	+1'0
North-Western Provinces and Oudh. Bihar	—0'2	+3'0	+1'7	+1'5
Chota Nagpur	—0'4	+1'4	+2'1	+1'0
Bengal	+2'3	+2'1	+3'6	+2'7
Bengal	+1'0	+1'3	+2'5	+1'6
Assam	+3'4	+4'2	+3'1	+3'6
Burma	+0'3	+0'9	—0'8	+0'1
Rajputana	+1'0	+5'0	+0'8	+2'3
Central India	+0'2	+3'7	+1'4	+1'8
Berar	+1'8	+3'6	+2'2	+2'5
Central Provinces	+0'6	+3'0	+1'6	+1'7
Deccan	+0'8	+0'8	+1'1	+0'9
West Coast	+1'0	+0'9	+1'1	+1'0
Madras Coast	+0'4	—0'3	+3'4	+1'2

(2) The variations of the mean minimum or night temperature from the normal on the mean of the period were similar in character to those of the maximum temperature. The mean night temperature was generally in defect in March, and in excess in April and May. The following gives comparative data :—

AREA.	VARIATION OF MEAN MINIMUM TEMPERATURE FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Hot weather period, March to May 1898.

Asiatic Turkey (Baghdad)	0	0	0	0
Persia (Bushire)	+1'5	+3'5	—1'8	+1'1
Baluchistan (Quetta)	—0'2	+0'2	+0'6	+0'2
Baluchistan (Quetta)	—1'1	—1'3	—0'1	—0'8
Punjab	+0'1	+3'9	+0'8	+1'6
Sind	—1'5	+1'4	+1'0	+0'3
North-Western Provinces and Oudh. Bihar	—0'9	+1'9	+0'1	+0'4
Bihar	—1'5	+2'3	+0'4	+0'4
Chota Nagpur	—1'3	+2'1	+1'9	+0'9
Bengal	—3'3	+2'0	+0'7	—0'2
Assam	—2'4	+2'3	+0'7	+0'2
Burma	—0'9	+1'7	+0'6	+0'3
Rajputana	—1'0	+3'2	+2'0	+1'4
Central India	—0'5	+3'4	+1'6	+1'5
Berar	+2'1	+4'8	+2'4	+3'1
Central Provinces	—0'1	+2'2	+1'9	+1'3
Deccan	—0'7	+1'2	+1'4	+0'6
West Coast	+0'4	+1'5	+0'8	+0'9
Madras Coast	—2'0	+0'9	+0'4	—2'0

(3) The mean daily temperature was on the average of the month of March in slight defect over the greater part of India, but the variations were everywhere small and unimportant. The mean temperature of April and May was above the normal almost without exception in India. The mean temperature of the month of April was in general excess in Upper Burma, and in slight to moderate defect in Lower Burma, where heavier rain than usual reduced temperature slightly below the normal. On the mean of the whole period temperature was in general slight to moderate excess, the excess being greatest in North-Western and Central India, Khandesh, Berar, the Central Provinces, North and East Bengal and Cachar. The following gives comparative data :—

AREA.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN			
	March 1898.	April 1898.	May 1898.	Hot weather period, March to May 1898.

Asiatic Turkey (Baghdad)	0	0	0	0
Persia (Bushire)	—2'4	+4'1	+0'7	+0'8
Persia (Bushire)	—1'4	—1'3	—0'6	—1'1
Baluchistan (Quetta)	—1'3	+1'9	—0'1	+0'2
Punjab	—0'4	+4'4	+0'2	+1'4

AREA.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN			
	March 1898.	April 1898.	May 1898.	Hot weather period, March to May 1898.
	0	0	0	0
Sind	-1'2	+2'6	+0'5	+0'6
North-Western Provinces and Oudh.	-0'6	+2'5	+0'9	+0'9
Bihar	-1'0	+1'9	+1'3	+0'7
Chota Nagpur	+0'5	+2'1	+2'8	+1'8
Bengal	-1'2	+1'7	+1'6	+0'7
Assam	+0'5	+3'3	+1'9	+1'9
Burma	-0'3	+1'3	-0'1	+0'3
Rajputana	0	+4'1	+1'4	+1'8
Central India	-0'2	+3'6	+1'5	+1'6
Berar	+2'0	+4'2	+2'3	+2'8
Central Provinces	+0'3	+2'6	+1'8	+1'6
Deccan	+0'1	+1'0	+1'3	+0'8
West Coast	+0'7	+1'2	+1'0	+1'0
Madras Coast	-0'8	+0'3	+1'9	+0'5

(4) Temperature was generally above the normal in March and April and below it in May at the hill stations in North-Western India. It was on the mean of the period in slight to moderate excess, the excess increasing eastwards from Murree to Ranikhet. The following gives data in illustration :—

STATION.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN			
	March 1898.	April 1898.	May 1898.	Hot weather period, March to May 1898.
	0	0	0	0
Ranikhet	+3'1	+4'9	+1'9	+3'3
Chakrata	+3'0	+3'7	-0'7	+2'0
Simla	+2'1	+4'1	+0'8	+2'3
Murree	-0'8	+6'3	-0'7	+1'6
Srinagar	+3'4	+1'9	-4'5	+0'3
Kailang	+5'0	+8'5	-1'1	+4'1
Leh	+2'1	+3'6	-1'2	+1'5

There were three very hot periods during the month of May. The first period was from the 1st to the 5th. The highest temperatures of the year were recorded in Burma, and also in Berar, Hyderabad and some parts of

the Central Provinces during this period. The following gives the most noteworthy of these :—

STATION.	Date.	Highest maximum temperature recorded in May 1898.
Akola	1st	116'0
Indur	3rd	115'5
Amraoti	1st	115'0

The most important feature of this period was the excessive temperature in Cachar and the Punjab hills. The following gives variation data for three stations in these two areas :—

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
1st May .	Murree	+12'7	+13'3	+13'0
	Ranikhet	+10'7	+10'8	+10'8
	Silchar	+12'1	+8'1	+10'1
2nd Do. .	Murree	+10'8	+13'3	+12'1
	Simla	+10'2	+9'9	+10'1
	Silchar	+12'8	+7'4	+10'1
3rd Do. .	Ranikhet	+10'9	+9'2	+10'1
	Silchar	+11'1	+9'5	+10'3
4th Do. .	Silchar	+14'3	+10'4	+12'4

The second period of very high temperature extended from the 6th to the 11th.

The position of the area of greatest excess of temperature during the period is indicated by the following variation data :—

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
6th May .	Peshawar	+11'5	+7'4	+13'0
7th Do. .	Peshawar	+10'9	+5'3	+8'1
	Peshawar	+14'0	+13'2	+13'6
8th Do. .	Rawalpindi	+11'9	+11'4	+11'7
	Mooltan	+13'3	+10'1	+11'7
	Dera Ismail Khan	+10'5	+11'7	+11'1
9th Do. .	Rawalpindi	+14'3	+8'0	+11'2
	Peshawar	+9'8	+11'8	+10'8

Temperature was hence most largely in excess in the North and West Punjab, and the highest temperatures of the month, and in some cases of the year, were registered in the Punjab on the 8th and 9th, as shown below :—

STATION.	DATE.	Highest maximum temperature recorded in May 1898.	Month and date.	Highest maximum temperature recorded in the year 1898.
Mooltan	8th May	117°0	June 5th	117°5
Montgomery	8th „	117°1	„ 22nd	118°6
Pachpadra	6th „	115°9	May 6th	115°9
Sirsa	8th „	115°3	June 6th	115°3
Jodhpur	7th „	114°3	May 7th	114°3
Khushab	8th „	113°4	June 8th	116°4
Umballa	9th „	112°9	„ 9th	115°4

A noteworthy feature of the same period was the very high temperature at the Madras coast stations from Cocanada to Negapatam, due to the prevalence of hot dry north-west winds blowing from the interior and heated in their descent to the coast.

The following gives variation data for four stations in illustration :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF					
	6th May.	7th May.	8th May.	9th May.	10th May.	11th May.
Cocanada	0	0	0	0	0	0
Masulipatam	+1°7	+5°3	+3°8	+0°7	+5°8	—0°1
Madras	+2°6	+4°3	+6°6	+9°8	+10°2	+9°8
Negapatam	+3°1	+5°2	+8°0	+7°2	+8°7	+4°8
	+5°9	—0°8	+5°2	+5°9	+7°3	+3°5

The excess at the coast stations was far more marked in the day than the night temperature, as is shown by the variation data of the following table :—

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
9th May	Masulipatam	+15°6	+3°9	+ 9°8
„ „	Madras	+10°6	+3°8	+ 7°2
„ „	Negapatam	+11°0	+0°7	+ 5°9
10th „	Masulipatam	+16°8	+3°5	+10°2
„ „	Madras	+13°0	+4°4	+ 8°7
„ „	Negapatam	+11°8	+2°8	+ 7°3
11th „	Masulipatam	+16°2	+3°3	+ 9°8
„ „	Madras	+10°8	—1°6	+ 4°6
„ „	Negapatam	+11°3	—2°9	+ 4°2

The highest day temperatures of the month were recorded at these coast stations during this period, and were comparable with the maxima temperatures recorded in the driest and hottest districts of the interior of India. The following gives data for these stations :—

STATION.	Highest maximum temperature recorded in May 1898.	Date on which recorded.
Masulipatam	115°7	10th
Nellore	114°8	11th
Cocanada	111°1	10th
Madras	110°0	10th

The most noteworthy feature of the temperature conditions of May was the great reduction of temperature which followed the precipitation in the plains and hills during the disturbed period of the second week of the month.

Temperature was very largely below the normal in North-Western India, and more especially in the North and North-East Punjab contiguous to the areas of heavy snow in the hills during the third week of May. The deficiency was much less in the night than in the day temperature. The following gives data showing the greatest deficiency of temperature and its locality on each day from the 13th to the 22nd of May :—

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRECEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
13th May	Sirsa	—17°7	—9°0	—13°4
„ „	Delhi	—17°2	—10°1	—13°7
14th „	Jeypore	—14°7	—8°7	—11°7
„ „	Sialkot	—15°6	—7°8	—11°7
15th „	Murree	—11°2	—11°9	—11°6
„ „	Dera Ismail Khan	—13°2	—6°6	—9°9

DATE.	STATION.	VARIATION FROM NORMAL OF ACTUAL TEMPERATURE OF 24 HOURS PRE- CEDING 8 A.M. OF DATE.		
		Maximum.	Minimum.	Mean.
16th May	Murree . . .	—20°9	—12°5	—16°7
" " . . .	Peshawar . . .	—14°9	—9°1	—12°0
17th " . . .	Murree . . .	—15°8	—7°9	—11°9
" " . . .	Peshawar . . .	—15°1	—7°9	—11°5
18th " . . .	Peshawar . . .	—12°5	—7°3	—9°9
" " . . .	Dera Ismail Khan . . .	—13°5	—5°0	—9°3
19th " . . .	Jeypore . . .	—10°7	—6°9	—8°8
" " . . .	Dera Ismail Khan . . .	—10°2	—9°7	—10°0
20th " . . .	Murree . . .	—9°4	—9°8	—9°6
21st " . . .	Murree . . .	—19°0	—9°4	—14°2
" " . . .	Rawalpindi . . .	—16°5	—10°4	—13°5
22nd " . . .	Ranikhet . . .	—3°0	—17°8	—10°4
" " . . .	Rawalpindi . . .	—6°7	—8°0	—7°4

As a result of the contrast between the excess in the day temperature of the second period and the diminished night temperature of the third period of the month of May in North-Western India, the absolute range of temperature during the month was unusually great and exceeded 50° at stations for which data are given below :—

STATION.	Absolute range during the month of May 1898.
Kalat	60°7
Pishin	54°1
Sharigh	51°8
Dras	50°8
Khushab	54°9
Peshawar	53°0
Rawalpindi	51°9
Sirsa	50°5

The third very hot period of the month was from the 29th to the 31st. The maxima temperatures of the year in Sind and North-West Rajputana were recorded during this period. The following gives the absolute maxima temperatures at stations in that area :—

STATION.	Date.	Highest maxi- mum temperature recorded in May 1898.
Jacobabad	31st	123°0
Bickaneer	31st	115°8
Hyderabad	30th	114°2

The period from the 1st to the 12th or 13th June was unusually hot over the greater part of the interior. The monsoon currents were established on the west coast on the 9th and 10th, and at the head of the Bay on the 11th and 12th. They advanced rapidly into the interior, and the area of greatest excess of temperature, which was in Berar and the Deccan at the beginning of the month, was transferred to the North-East Punjab from the 6th to the 8th and to the West Punjab on the 10th. These changes are illustrated by the following data for the stations at which temperature was most largely in excess on each day from the 1st to the 13th :—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum tempera- ture.	Minimum tempera- ture.	Mean tempera- ture.
1st June . . .	Mooltan . . .	+ 9°0	+ 9°1	+ 9°1
2nd " . . .	Sholapur . . .	+ 8°3	+ 8°8	+ 8°6
3rd " . . .	Hyderabad (Deccan)	+ 9°5	+ 9°8	+ 9°7
4th " . . .	Sholapur . . .	+ 10°0	+ 7°4	+ 8°7
5th " . . .	Chanda . . .	+ 11°4	+ 9°7	+ 10°6
6th " . . .	Rawalpindi . . .	+ 10°2	+ 15°1	+ 12°7
7th " . . .	Ludhiana . . .	+ 8°9	+ 12°3	+ 10°6
8th " . . .	Ludhiana . . .	+ 6°8	+ 14°1	+ 10°5
9th " . . .	Sialkot . . .	+ 7°6	+ 12°0	+ 9°8
10th " . . .	Rawalpindi . . .	+ 6°0	+ 12°4	+ 9°2
11th " . . .	Rawalpindi . . .	+ 4°7	+ 11°6	+ 8°2
12th " . . .	Mooltan . . .	+ 8°1	+ 7°6	+ 7°9
13th " . . .	Mooltan . . .	+ 4°1	+ 10°7	+ 7°4

The highest temperatures of the month were generally recorded in Upper India between the 1st and the 12th.

The following gives the highest temperatures recorded at the hottest stations during this period :—

STATION.	Highest maxi- mum temperature recorded in June 1898.	Date on which recorded.
Jacobabad	122°0	8th
Bickaneer	113°9	1st
Mooltan	117°5	5th
Ludhiana	115°3	7th
Lahore	114°6	7th
Sialkot	117°0	7th

III.—The south-west monsoon period.—The variations of the temperature conditions from the normal were dependent upon the distribution of the rainfall. The first advance of monsoon winds occurred slightly later than usual in the Arabian Sea. They set in on the 9th and 10th on the Konkan Coast, and extended rapidly into the interior of Central and North-Western India. The rains were initiated in Bengal by a storm which formed in the north-west of the Bay on the 12th and 13th. The monsoon current on the West Coast fell off rapidly on the 17th and 18th, and a short break in the rains commenced in Upper India on the 19th. It extended to the Gangetic Plain, Central India and the Deccan on the 21st and to Bengal on the 25th. Rain recommenced on the 29th and was fairly general on the 30th.

The currents were fairly steady in July and the greater part of India received abundant and favourable rain. The Bombay current was weak in August, and hence those areas which are chiefly dependent upon it including the Punjab, the Deccan, the West coast districts, Berar and Rajputana received less rain than usual, whilst the districts chiefly receiving rain from the Bay current obtained an excess of rain. In September the whole of India with the exception of Orissa, Sind, the Punjab, Rajputana, Central India, North Bombay, Berar and the Central Provinces obtained larger amounts of rain than usual. The excess was on the whole most pronounced in the Deccan and Southern India, and the deficiency in the Punjab and Rajputana. The following summarizes the chief features of the mean temperature conditions of the period :—

1st.—Temperature was in considerable excess in Upper India (including the Punjab, Sind, and Rajputana) in June and August, and in slight to moderate excess in the same area (excepting the submontane and hill districts of the Punjab) in July and September.

The following gives comparative data :—

AREA.	VARIATION OF MEAN TEMPERATURE FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Punjab	+3'6	—1'3	+3'1	+0'5	+1'5
Rajputana	+3'1	+2'5	+3'8	+2'4	+2'9
Sind	+1'9	+0'7	+0'4	+1'0	+1'0

2nd.—Temperature was throughout in slight to moderate defect over the greater part of the Gangetic Plain, Bengal and Orissa and was on the mean of the whole period normal or in very slight defect in these areas. It was

normal also in Burma and Assam, as shown below :—

AREA.	VARIATION OF MEAN TEMPERATURE FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Burma	+1'0	+0'3	—0'1	+0'2	+0'3
Assam	+1'1	+0'5	+0'2	—1'2	+0'1
Bengal	—0'1	+0'3	+0'3	—0'7	0
Orissa	+0'8	—0'3	—0'3	+0'6	0
Chota Nagpur . .	—0'3	+0'2	—0'2	+0'1	0
Bihar	+0'1	+0'8	—0'3	—1'9	—0'3
North-Western Provinces and Oudh.	+0'1	—0'5	—0'7	—0'9	—0'5

3rd.—The temperature was throughout in slight excess over the greater part of the Peninsula. On the mean of the period temperature was normal or in very slight excess. The following gives comparative data :—

AREA.	VARIATION OF MEAN TEMPERATURE FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Berar	+0'9	+0'2	—1'6	+0'9	+0'1
Central Provinces .	+1'2	—0'2	—1'8	+0'3	—0'1
Hyderabad . . .	+2'5	—0'1	+0'9	+1'2	+1'1
Kathiawar and Cutch	+0'5	+1'0	+1'2	—0'2	+0'6
Khandesh	+1'2	+0'6	—0'6	+0'3	+0'4
West Coast . . .	+0'9	+0'4	+1'1	+0'2	+0'6
Bombay Deccan . .	+1'6	+0'3	+0'2	+0'4	+0'6
Madras Coast . . .	+0'1	+0'8	+1'0	—0'4	+0'4
Madras Deccan . .	+0'8	+0'9	+2'0	—0'3	+0'8
Mysore	+0'3	+1'1	+1'7	0	+0'8
South India . . .	+1'8	+2'0	+2'0	—0'2	+1'4

IV.—The retreating south-west monsoon period.—The rains ceased somewhat earlier than usual over the whole of Northern and Central India and the North Deccan. A storm, which formed in the centre of the Bay on the 6th and 10th October, advanced to the Circars and there recurved, marching through Ganjam and Orissa into South-West and Central Bengal. It gave very heavy rain from the 12th to the 16th in North-Eastern India, the

last rain due to the south-west monsoon in Northern India. Burma received showers until the 22nd, when fine dry weather set in and continued steadily during the remainder of the period. Southern India, more especially the Coromandel coast districts, had moderate to heavy daily rain in the last week of the month. A cyclonic storm, which formed in the south-west of the Bay and crossed the Coromandel Coast on the 6th November, was followed by daily rain in Southern India until the 16th, when dry weather set in for a short period (until the 25th). Weather was showery and feebly unsettled from that date to the end of the month and also from the 1st to the 3rd, the 17th to the 23rd and the 25th to the 30th December. The rainfall was heavy between the 26th and 30th November, and again from the 25th to the 30th December.

Fine and unusually dry weather held steadily in North-Western and Central India during the season until the last week of December, when a cold weather storm gave moderate to heavy snow in the hill districts in Upper India.

The abnormal features of the temperature conditions of the period were chiefly due to the abnormal distribution of the rainfall of the period—more especially the deficiency in Burma and excess in the southern half of the Peninsula.

The following give the most noteworthy features of the day temperature of the period :—

(a) The mean maximum temperature was considerably in excess in October and November in Rajputana, Kathiawar, Cutch, the Konkan, Central India, Berar, the Central Provinces, Hyderabad and the Bombay Deccan. It was also slightly in excess over the greater part of that area in December. The following gives data :—

AREA.	VARIATION FROM NORMAL OF MEAN MAXIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Rajputana	+4'1	+3'9	—1'4	+3'3
Cutch	+3'6	+4'5	—2'0	+2'0
Kathiawar	+3'4	+3'9	—2'4	+1'6
Konkan	+2'4	+1'3	+1'0	+1'6
Bombay Deccan	+2'9	+1'9	+2'7	+2'5
Central India	+3'1	+4'4	+1'3	+2'9
Berar	+4'0	+4'9	+6'1	+5'0
Hyderabad	+3'7	+1'7	+3'7	+3'0
Central Provinces	+1'9	+3'6	+4'3	+3'3
Chota Nagpur	—0'3	+2'1	+3'0	+1'6

The excess was greatest in the area represented by the stations for which comparative data are given below :—

STATION.	VARIATION FROM NORMAL OF MEAN MAXIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Akola	+4'3	+5'1	+6'5	+5'4
Khandwa	+4'2	+6'4	+5'3	+5'3
Amraoti	+3'5	+4'7	+5'7	+4'6
Nagpur	?	+4'1	+3'0	?
Indore	+3'3	+4'7	+2'5	+3'6
Neemuch	+4'3	+4'7	—0'5	+2'8
Deesa	+5'9	+5'0	—2'1	+2'9

(b) The maximum day temperature was steadily in excess throughout the period in Burma, as shown below :—

AREA.	VARIATION FROM NORMAL OF MEAN MAXIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Lower Burma	+2'0	+1'6	+0'7	+1'4
Burma Island	+0'1	+2'5	+2'2	+1'6

(c) The day temperature differed by very small amounts from the normal throughout the period in North-Eastern India, though there was a slight tendency to higher temperature than usual in November and December, as is shown by the data given below :—

AREA.	VARIATION FROM NORMAL OF MEAN MAXIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	
Assam	—0'1	+0'4	+0'6	+0'3
Bengal	—0'7	+0'6	+0'5	+0'1
Bihar	—0'3	+1'2	+1'0	+0'6

(d) The mean maximum temperature was either normal or in slight defect over the greater part of Southern India.

This feature is most fully shown by the data for the following six stations :—

STATION.	VARIATION FROM NORMAL OF MEAN MAXIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Madras	—0'8	—1'0	+0'4	—0'5
Negapatam	+1'3?	—1'0	?	?
Salem	—0'1	—2'3	—1'2	—1'2
Trichinopoly	—0'1	—1'6	0	—0'6
Madura	—2'4	—1'6	—1'3	—1'8
Coimbatore	—0'1	—1'9	—0'8	—0'9

The variations of the mean minimum temperature from the normal were even more marked than those of the day or maximum temperature. The following summarizes the chief features :—

(1) The mean minimum temperature was in slight to large excess in the area including the North-Western Provinces, Rajputana, Cutch, Kathiawar, Gujarat, Central India, Berar, Khandesh and the Central Provinces during November and December and in the Bombay Deccan and Hyderabad throughout the period, as shown below :—

AREA.	VARIATION FROM NORMAL OF MEAN MINIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
North-Western Provinces and Oudh.	—1'1	+0'8	+2'9	+0'9
Rajputana	—0'7	+2'5	+1'5	+1'1
Cutch	+0'4	+4'3	+1'9	+2'2
Kathiawar	—0'8	+6'2	+2'9	+2'8
Gujarat	?	+4'8	+5'8	?
Central India	—1'0	+3'5	+4'9	+2'5
Berar	—1'5	+2'1	+8'0	+2'9
Central Provinces	—2'2	+1'3	+5'6	+1'6
Khandesh	—0'9	+2'6	+7'3	+5'0
Bombay Deccan	+0'8	+0'1	+4'3	+1'7
Hyderabad	+1'8	+0'6	+5'5	+1'4

The excess was most pronounced in the area including the stations for which comparative data are given below, and was abnormally large in December :—

STATION.	VARIATION FROM NORMAL OF MEAN MINIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Akola	—1'5	+2'1	+9'7	+3'4
Khandwa	—2'4	+3'5	+8'9	+3'3
Amraoti	?	+3'2?	+6'3	?
Malegaon	—0'9	+2'6	+7'3	+3'0
Hoshangabad	—1'8	+3'1	+6'4	+2'6
Sholapur	+1'0	+0'6	+5'9	+2'5
Jubbulpore	—2'5	+2'2	+6'3	+2'0

(2) The night temperature was in slight excess in the area of rainfall in Southern India. The following gives comparative data :—

STATION.	VARIATION FROM NORMAL OF MEAN MINIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Madras	—0'5	+0'6	+1'0	+0'4
Negapatam	+0'8	+0'7	?	?
Salem	+1'5	+0'4	+1'2	+1'0
Trichinopoly	+0'9	+0'2	+1'5	+0'9
Madura	+0'5	—0'3	+0'7	+0'3
Coimbatore	+0'9	—0'4	—0'1	+0'1

(3) The mean minimum temperature was generally normal or in slight defect in North-Eastern India due to the prevalence of drier weather than usual. The following data illustrate this feature :—

AREA.	VARIATION FROM NORMAL OF MEAN MINIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Assam	—0'4	—1'1	+0'2	—0'4
Bengal	—0'3	+0'1	+0'3	0
Bihar	—0'6	+0'6	+1'6	+0'5

(4) The night temperature was below the normal to a slight extent in Burma. This was due to the prevalence of unusually dry weather following the early termination of the rains. This favoured rapid nocturnal radiation, and hence, although the day temperature was above the normal, the mean minimum temperature was below it, the deficiency being greatest in the coast districts of Lower Burma. The following gives comparative data for seven representative stations :—

STATION.	VARIATION FROM NORMAL OF MEAN MINIMUM TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Mergui	+2'6	+1'5	?	?
Tavoy	+0'1	—0'9	?	?
Moulmein	+0'9	—0'1	—1'6	—0'3
Rangoon	?	—2'4	?	?
Bassein	+1'5	—0'7	—0'1	+0'2
Diamond Island	?	?	+1'4	?
Akyab	+0'7	—1'9	—2'2	—1'1

The chief abnormal features of the mean temperature of the period were as follows :—

(1) The mean temperature of Burma was practically normal, but the diurnal range averaged about $1\frac{1}{2}^{\circ}$ above the normal, as the maximum temperature was slightly above the normal and the minimum temperature normal. The following gives comparative data :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Burma Coast	+1'6	+0'2	°	+0'6
Burma Inland	+0'4	+0'5	+2'1	+1'0

(2) The mean temperature of the period was in very slight excess in North-Eastern India. Both the maximum and minimum temperatures were below the normal by small amounts in October and generally above it in November and December. The following gives variation data of the mean temperature from the normal in this area :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Assam	—0'2	—0'2	+0'5	°
Bengal	—0'5	+0'3	+0'4	+0'1
Bihar	—0'5	+0'9	+1'4	+0'6

(3) In Southern India temperature was practically normal, as in Burma, but the diurnal range averaged about 1° less than usual due to the night temperature being above the normal to a greater extent than the day temperature. The following gives comparative data for six stations :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Madras	—0'7	—0'2	+0'7	—0'1
Negapatam	+1'1	—0'2	?	?
Salem	+0'7	—1'0	°	—0'1
Trichinopoly	+0'4	—0'7	+0'8	+0'2
Madura	—1'0	—1'0	—0'3	—0'8
Coimbatore	+0'4	—1'2	—0'5	—0'4

(4) The important feature was the unusually high temperature in the large area including Rajputana, Central India, Cutch, Kathiawar, Gujarat, Khandesh, Berar, the Bombay Deccan, Hyderabad, the Central Provinces, Chota Nagpur and the southern districts of the North-Western Provinces. The following gives data showing the amount of the excess :—

AREA.	VARIATION FROM NORMAL OF MEAN TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	°	°	°	°
Rajputana	+1'6	+3'1	+0'1	+1'6
Cutch	+2'0	+4'4	—0'1	+2'1
Kathiawar	+1'3	+5'1	+0'3	+2'2
Gujarat	?	+4'3	+3'6	?
Khandesh	+1'6	+3'5	+5'5	+3'5
Central India	+1'1	+4'0	+3'4	+2'8
Berar	+1'5	+3'6	+7'1	+4'1
Central Provinces	—0'2	+2'5	+5'0	+2'4
Bombay Deccan	+1'9	+1'0	+3'5	+2'1
Hyderabad	+2'6	+1'2	+4'6	+2'8
North-Western Provinces and Oudh	+0'2	+1'3	+1'6	+1'0
Chota Nagpur	—0'6	+1'1	+2'9	+1'1

The following gives comparative data for stations in the area of greatest excess :—

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.

Akola	+1'5	+3'6	+8'1	+4'4
Amraoti	?	+4'0	+6'0	?
Khandwa	+0'9	+5'0	+7'1	+4'3
Malegaon	+1'6	+3'5	+5'5	+3'5
Nagpur	+1'0	+2'9	+5'2	+3'0
Hoshangabad	+0'6	+3'2	+4'8	+2'9
Indore	+1'3	+4'3	+3'6	+3'1
Neemuch	+1'7	+4'2	?	?
Deesa	+2'6	+5'3	+1'0	+3'0

As already pointed out the excess in this area was much greater in the night than the day temperature. The conditions and relations were hence altogether different from those usually obtaining in finer and drier weather than usual in Northern India. These temperature features were most pronounced during the first half of December. The following gives the variations of the maximum, minimum and mean temperatures, day by day, for two stations at which the mean temperature was most largely in excess from the 3rd to the 15th :—

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature.	Minimum temperature.	Mean temperature.
		.	.	.
3rd December 1898 .	Malegaon .	+ 1'2	+20'0	+10'6
3rd " "	Khandwa .	+ 5'4	+12'2	+ 8'8
4th " "	Khandwa .	+ 8'6	+19'4	+14'0
4th " "	Akola .	+ 6'0	+14'2	+10'1
5th " "	Khandwa .	+ 9'1	+22'2	+15'7
5th " "	Malegaon .	+ 9'4	+18'1	+13'8
6th " "	Akola .	+ 9'7	+20'1	+14'9
6th " "	Khandwa .	+ 8'6	+20'6	+14'6
7th " "	Khandwa .	+ 7'7	+17'7	+12'7
7th " "	Akola .	+ 7'3	+16'4	+11'9
8th " "	Khandwa .	+ 7'2	+19'0	+13'1
8th " "	Akola .	+ 9'0	+16'2	+12'6
9th " "	Khandwa .	+ 8'4	+14'4	+11'4

DATE.	STATION.	VARIATION FROM NORMAL OF		
		Maximum temperature.	Minimum temperature.	Mean temperature.
9th December 1898 .	Akola . .	+ 8'1	+13'6	+10'9
10th " "	Khandwa .	+ 9'9	+16'4	+13'2
10th " "	Akola . .	+10'1	+14'8	+12'5
11th " "	Khandwa .	+ 9'9	+17'6	+13'8
11th " "	Akola . .	+ 9'3	+13'9	+11'6
12th " "	Jubbulpore .	+11'7	+16'1	+13'9
12th " "	Saugor . .	+11'4	+15'1	+13'3
13th " "	Jubbulpore .	+11'7	+17'5	+14'6
13th " "	Akola . .	+10'2	+14'2	+12'2
14th " "	Jubbulpore .	+ 8'8	+14'2	+11'5
14th " "	Akola . .	+ 8'8	+12'7	+10'8
15th " "	Sambalpur .	+ 7'5	+13'4	+10'5
15th " "	Akola . .	+ 8'5	+11'6	+10'1

The year.—The following table gives the variations of the mean temperature of Extra-Tropical and Tropical India and also of the whole of India from the normal, month by month, during the year 1898 :—

MONTH.	VARIATION FROM NORMAL OF MEAN DAILY TEMPERATURE IN		
	Extra-Tropical India. From Table II.	Tropical India. From Table II.	Whole India. From Table II.
	.	.	.
January	+1'5	—0'1	+0'8
February	+0'1	—0'3	—0'1
March	+0'6	+0'2	+0'5
April	+3'4	+1'2	+2'5
May	+0'5	+0'6	+0'6
June	+1'0	+0'6	+0'8
July	—0'4	+0'2	—0'1
August	+0'4	+0'3	+0'3
September	—0'3	+0'1	—0'2
October	+0'8	+1'1	+0'9
November	+0'8	+0'5	+0'7
December	+0'6	+1'8	+1'1
Whole year	+0'8	+0'5	+0'7

The following table gives the progressive variation of the mean annual temperature of the past 24 years :—

YEAR.	Number of stations.	Mean anomaly.	Progressive variation.
1875	72	—0'29	...
1876	72	—0'08	+0'21
1877	74	+0'17	+0'25
1878	74	+0'62	+0'45
1879	70	—0'13	—0'75
1880	106	+0'13	+0'26
1881	110	—0'01	—0'14
1882	113	—0'11	—0'10
1883	122	—0'48	—0'37
1884	122	—0'61	—0'13
1885	118	—0'29	+0'32

YEAR.	Number of stations.	Mean anomaly.	Progressive variation.
1886	122	+0'08	+0'37
1887	126	—0'23	—0'31
1888	127	+0'36	+0'59
1889	81	+0'86	+0'30
1890	85	+0'13	+0'73
1891	72	—0'03	—0'16
1892	74	+0'66	+0'69
1893	68	—1'33	—1'99
1894	66	+0'11	+1'44
1895	69	+0'35	+0'24
1896	67	+1'30	+0'95
1897	75	+0'90	—0'40
1898	75	+0'65	—0'25

Atmospheric Pressure.

Full information of the barometers in use at Indian observatories and of the methods of reducing the observations and obtaining the mean daily and monthly pressures will be found in the annual reports formerly issued by the Department (e.g., pages 58 and 59 of the report for 1890) and also in pages 8-9 of the monthly review for January 1898.

In Table II of each monthly review the monthly mean daily pressure (corrected for temperature) is given in the fifth figure column, and the variation from the normal in the sixth figure column. The normal monthly mean pressure values were recalculated for all first and second class stations in 1896, and will be found in Table VI of the Annual Summary for that year. The additional data for the years 1891—1895 were utilized in calculating these means, which are hence based upon the whole of the available data up to the end of 1896. The variation data in the monthly reviews for the year 1898 were obtained by a comparison of the actual monthly means with the corresponding normal monthly means published in the Annual Summary for 1896, and the variations of the monthly pressures of all first and second class stations in 1898 are given in Table V (below). The figures in the fifth and sixth figure columns of Table II appended to the present Annual Summary, giving the mean pressure of the air and its variation from the normal for all first and

second class stations, are comparable with the corresponding data of previous years published in the annual reports and summaries.

In the seventh figure column of Table II in each monthly review the mean pressures reduced to sea-level and corrected to constant gravity (Lat. 45°) are given. These, it should be noted, are not comparable with the sea-level pressure values of the years 1875—90 as given in the Annual Reports for those years, for previously to 1891 no correction was made to reduce the monthly pressure means to standard gravity.

In Table I of each monthly review and also in that appended to the Annual Summary, the pressure data are given for a fixed hour (*vis.*, 8 A.M., local time) of the day. The second figure column in those tables gives the mean 8 A.M. pressures for the month corrected for temperature. In the third figure column the variations of the mean 8 A.M. pressures from the normal mean 8 A.M. pressures are exhibited.

Normal 8 A.M. mean monthly data for the great majority of stations will be found in the Annual Summary of 1894, Tables VII and VII

The mean pressure data for the year 1898 will be found under the headings "Pressure" in Tables I and I appended to the present Annual Summary.

TABLE V.—Comparison of monthly mean pressures in 1898 with the averages of past years.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
		"	"	"	"	"	"	"	"	"	"	"	"	"
BURMA COAST AND BAY ISLANDS.	Port Blair .	+ '017	— '069	— '025	+ '007	0	— '013	— '020	+ '012	+ '014	— '008	— '024	0	— '009
	Rangoon .	+ '011	— '086	— '046	— '007	— '023	— '038	— '023	— '011	+ '009	— '017	— '038	— '020	— '024
	Diamond Is- land.	+ '006	— '083	— '040	— '004	— '024	— '035	— '025	— '006	+ '017	— '014	— '034	— '015	— '021
	Cocos Island.	+ '009	— '078	— '021	?	+ '020	— '023	— '015	— '006	+ '017	— '016	— '042	— '036	?
	Akyab .	0	— '078	— '041	— '010	— '030	— '037	— '017	— '027	+ '016	— '002	— '031	— '023	— '023
ASSAM	Silchar .	+ '015	— '067	— '033	— '031	— '027	— '031	— '014	— '039	+ '019	— '001	— '030	— '028	— '022
	Sibsagar .	+ '006	— '069	— '037	— '008	— '014	— '046	— '007	— '043	+ '005	— '003	— '034	— '048	— '025
	Dhubri .	+ '007	— '064	— '013	?	— '027	— '043	— '017	— '057	+ '006	— '014	— '024	— '037	?
BENGAL AND ORISSA.	Chittagong .	— '002	— '076	— '037	— '011	— '022	— '043	— '031	— '058	+ '004	— '011	— '042	— '031	— '030
	Narayanganj.	+ '005	— '064	— '025	— '001	— '009	— '021	— '010	— '047	+ '019	— '001	— '031	— '025	— '018
	Calcutta (Ali- pur).	+ '017	— '058	— '019	— '005	— '008	— '018	— '014	— '048	+ '015	+ '006	— '033	— '032	— '016
	Saugor Island	+ '001	— '069	— '026	— '007	— '013	— '031	— '025	— '050	+ '005	0	— '039	— '045	— '025
	Burdwan .	+ '003	— '071	— '014	— '011	— '015	— '020	— '014	— '054	+ '004	0	— '024	— '031	— '021
	Berbampore .	+ '012	— '056	— '013	— '013	— '008	— '014	— '012	— '054	+ '007	— '002	— '027	— '032	— '018
	False Point .	+ '008	— '068	— '024	— '012	— '012	— '039	— '035	— '040	— '002	— '003	— '037	— '041	— '025
	Cuttack .	+ '016	— '056	— '014	— '008	— '005	— '028	— '027	— '025	+ '001	0	— '023	— '036	— '018
GANGETIC PLAIN AND CHOTA NAGPUR.	Hazaribagh .	+ '004	— '068	— '013	— '020	— '023	— '023	— '031	— '053	— '008	— '007	— '039	— '047	— '027
	Patna .	+ '011	— '068	— '014	— '030	— '018	— '015	— '023	— '049	— '003	0	— '034	— '049	— '024
	Darbhanga .	+ '007	— '076	— '021	— '018	— '024	— '020	— '018	— '050	— '008	— '012	— '038	— '047	— '027
	Allahabad .	+ '013	— '073	+ '003	— '026	— '011	— '023	— '020	— '035	+ '006	— '003	— '035	— '042	— '021
	Lucknow .	+ '009	— '070	— '003	— '023	— '012	— '029	— '011	— '047	— '003	— '006	— '043	— '050	— '024
UPPER SUB-HIMALAYAS.	Dehra Dun .	+ '009	— '080	— '008	— '019	— '020	— '045	— '002	— '036	— '002	— '017	— '032	— '046	— '025
	Roorkee .	+ '004	— '075	— '005	— '018	— '010	— '033	+ '006	— '034	0	— '012	— '034	— '041	— '021
	Meerut .	+ '001	— '076	+ '004	— '024	— '002	— '034	+ '002	— '035	+ '004	— '009	— '047	— '047	— '022
	Lahore .	— '001	— '103	— '002	— '040	— '008	— '056	+ '015	— '051	— '012	— '019	— '043	— '047	— '030
	Ludhiana .	+ '006	— '089	+ '002	— '022	— '013	— '057	+ '009	— '041	— '003	— '011	— '035	— '036	— '024
INDUS VALLEY AND NORTH-WEST RAJPUTANA.	Peshawar .	+ '004	— '116	+ '002	— '040	0	— '069	— '001	— '070	— '013	— '033	— '041	— '047	— '035
	Mooltan .	+ '005	— '110	+ '011	— '038	+ '003	— '048	+ '002	— '044	— '014	— '019	— '032	— '032	— '026
	Jacobabad .	+ '007	— '108	+ '021	— '037	— '009	— '058	— '010	— '045	— '027	— '026	— '035	— '042	— '031
	Kurrachee .	+ '017	— '097	— '004	— '038	+ '012	— '023	— '011	+ '004	— '014	— '018	— '047	— '023	— '020

TABLE V.—Comparison of monthly mean pressures in 1898 with the averages of past years—contd.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		"	"	"	"	"	"	"	"	"	"	"	"	"
EAST RAJPU- TANA, CEN- TRAL INDIA, AND GUJA- RAT.	Jeypore	+ '034	- '083	+ '023	- '010	+ '001	- '028	- '011	- '013	+ '001	- '007	- '042	- '038	- '014
	Ajmere	+ '023	- '100	+ '008	- '023	+ '002	- '038	- '031	- '021	- '007	- '022	- '060	- '056	- '027
	Deesa	+ '037	- '084	+ '010	- '013	+ '010	- '025	- '028	+ '004	- '006	- '019	- '046	- '023	- '015
	Nowgong	+ '028	- '081	+ '017	- '024	- '001	- '017	- '009	- '010	+ '016	- '025	?	?	?
	Agra	+ '008	- '090	- '005	- '040	- '018	- '053	- '019	- '033	- '011	- '025	- '058	- '054	- '033
	Belgaum	+ '026	- '061	- '010	- '025	- '012	- '023	- '040	+ '012	- '017	- '016	- '033	- '023	- '019
	Sholapur	+ '037	- '058	- '010	- '020	+ '001	- '022	- '034	+ '015	- '009	- '010	- '031	- '028	- '014
	Poona	+ '040	- '056	- '009	- '018	0	- '013	- '028	+ '025	- '012	- '013	- '029	- '029	- '012
	Akola	+ '056	- '054	+ '008	- '019	- '006	- '021	- '034	+ '013	- '006	- '012	- '043	- '042	- '013
	Buldana	+ '049	- '064	- '004	- '020	0	- '017	- '031	+ '017	0	- '002	- '033	- '031	- '012
DECCAN	Khandwa	+ '053	- '100	0	- '028	+ '007	- '008	- '023	+ '021	+ '006	+ '001	- '032	- '034	- '011
	Hoshangabad	+ '048	- '067	+ '005	- '032	- '005	- '019	- '026	+ '014	+ '023	+ '012	- '026	- '034	- '010
	Nagpur	+ '046	- '054	+ '016	- '013	- '004	- '007	- '020	+ '016	+ '027	- '025	- '024	- '029	- '006
	Jubbulpore	+ '034	- '073	?	?	- '012	- '014	- '020	- '015	+ '009	0	- '043	- '042	?
	Saugor	+ '032	- '073	+ '006	- '017	+ '011	- '010	- '003	+ '010	+ '009	- '004	- '029	- '040	- '009
	Sutna	+ '027	- '077	+ '006	- '027	- '006	- '024	- '025	- '029	0	- '004	- '034	- '040	- '019
	Raipur	+ '042	- '053	+ '015	- '004	+ '005	- '011	- '023	- '004	+ '022	0	- '025	- '033	- '006
	Hyderabad (Deccan).	+ '037	- '054	+ '005	- '006	- '008	- '016	- '032	+ '019	+ '002	- '002	- '045	- '040	- '012
	Bombay	+ '023	- '047	- '023	- '018	+ '003	- '009	- '031	+ '031	- '017	- '022	- '043	- '025	- '015
	Ratnagiri	+ '024	- '044	- '016	- '012	+ '004	- '009	- '031	+ '030	- '021	- '026	- '036	- '025	- '014
WEST COAST	Karwar	+ '010	- '054	- '024	- '021	- '008	- '011	- '040	+ '021	- '026	- '032	- '040	- '029	- '021
	Cochin	+ '017	- '042	- '013	- '009	- '010	- '008	- '031	+ '011	- '019	- '028	- '036	- '025	- '016
	Salem	+ '019	- '069	- '019	- '028	- '024	- '023	- '053	- '010	- '020	- '016	- '033	- '014	- '024
	Mercara	+ '018	- '049	- '015	- '013	- '004	- '005	- '028	+ '024	- '022	- '022	- '033	- '024	- '014
	Chitaldroog	+ '040	- '060	+ '005	- '010	- '012	+ '002	- '032	+ '024	- '010	- '012	- '045	- '032	- '012
	Bangalore	+ '011	- '062	- '015	- '013	- '007	- '007	- '034	+ '014	- '020	- '017	- '037	- '016	- '017
	Hassan	+ '031	- '061	+ '005	- '007	- '015	+ '006	- '032	+ '016	- '018	- '021	- '048	- '025	- '014
	Mysore	+ '023	- '065	+ '004	- '010	- '019	+ '005	- '032	+ '013	- '012	- '018	- '046	- '023	- '015
	Trichinopoly	+ '028	- '069	- '017	- '027	- '029	- '019	- '045	- '001	- '009	- '010	- '031	- '012	- '020
	Madras	+ '026	- '060	- '011	- '017	- '010	- '012	- '042	+ '008	0	- '003	- '039	- '012	- '014
SOUTH INDIA	Bellary	+ '024	- '058	- '011	- '022	- '006	- '017	- '037	+ '010	- '017	- '022	- '040	- '021	- '018
	Cocanada	+ '028	- '067	+ '004	+ '005	?	- '016	- '025	+ '021	+ '019	- '016	- '050	- '029	?
	Vizagapatam	+ '026	- '054	- '013	- '008	- '003	- '029	- '039	- '003	+ '011	- '002	- '021	- '020	- '013
	Quetta	+ '081	- '073	+ '021	+ '025	- '005	- '012	- '002	+ '003	- '006	+ '010	- '006	- '034	0
HILL STATION, BALUCHISTAN.														

TABLE V.—Comparison of monthly mean pressures in 1898 with the averages of past years—concl'd.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
		"	"	"	"	"	"	"	"	"	"	"	"	"
HILL STATIONS, NORTHERN INDIA.	Leh . . .	+ '074	— '087	— '023	+ '049	— '015	+ '006	+ '008	— '012	— '009	+ '054	+ '003	— '052	0
	Srinagar . .	+ '088	— '120	— '012	+ '011	— '005	— '049?	+ '010	— '034	+ '006	— '006	— '046	— '071	— '019
	Morree . .	+ '060	— '062	+ '010	+ '033	0	— '017	+ '003	— '020	— '041	— '022	— '036	— '068	— '013
	Kailang . .	+ '027	— '099	— '025	?	?	?	?	— '039	— '031	?	?	?	?
	iSmla (Ridge)	+ '054	— '069	+ '019	+ '038	— '010	— '018	0	— '007	— '001	+ '004	— '014	— '034	— '003
	Chakrata . .	+ '033	— '062	+ '016	+ '024	— '002	— '032	+ '011	— '010	— '008	+ '002	— '017	— '037	— '007
	Ranikhet . .	+ '039	— '050	+ '016	+ '020	+ '001	— '024	— '002	— '021	0	+ '013	— '016	— '020	— '004
	Katmandu . .	— '008	— '081	— '026	?	— '012	— '024	?	?	?	— '058	— '073	— '041	?
	Darjeeling . .	+ '066	+ '008	+ '036	+ '045	— '007	— '022	— '006	— '039	— '024	— '020	— '053	— '054	— '006
HILL STATIONS, CENTRAL INDIA.	Mount Abu . .	+ '041	— '099	+ '007	— '015	— '009	— '015	— '031	— '009	— '014	— '018	— '038	— '044	— '020
	Pachmarhi . .	+ '038	— '074	+ '009	— '008	+ '004	— '013	— '024	— '005	+ '006	+ '004	— '021	— '025	— '009
	Chikalda . .	+ '033	— '073	+ '002	— '014	+ '004	— '010	— '027	0	+ '005	— '011	— '023	— '027	— '012
HILL STATION, SOUTHERN INDIA.	Wellington . .	+ '011	— '065	— '010	— '018	— '014	— '015	— '038	+ '003	— '024	— '016	— '042	— '018	— '021
EXTRA INDIAN STATIONS.	Muscat . .	+ '058	— '045	+ '034	— '003	?	?	?	?	?	?	?	?	?
	Aden . .	+ '028	— '026	— '028	+ '006	— '011	— '012	— '034	— '012	— '040	— '009	— '040	+ '001	— '015
	Perim . .	+ '045	— '004	— '003	+ '011	— '004	?	— '022	— '029	— '050	— '024	— '058	+ '011	?
	Zanzibar . .	+ '020	+ '016	— '014	— '021	— '049	— '014	— '038	— '009	— '031	— '005	— '049	— '033	— '019.
	Port Victoria (Seychelles.)	+ '010	— '050	— '013	— '016	— '041	— '013	— '040	— '005	— '036	+ '001	— '030	— '029	— '022

The following tables give the geographical summaries of the pressure variation data according to the two groups of divisions employed in the corresponding tables of temperature variation data, that is, for the eighteen

divisions for which the variation data were given in the "Geographical Summaries" in the annual reports previous to 1891 and for the eleven meteorological provinces in Table I of each monthly review :—

TABLE VI.—Geographical summary of the pressure variation data of Table II in the monthly weather reviews of 1898.

METEOROLOGICAL PROVINCE.	Number of stations	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
		"	"	"	"	"	"	"	"	"	"	"	"	"
North-West Himalayas	6-7	+ '054	— '078	0	+ '029	— '005	— '022	+ '005	— '020	— '012	+ '008	— '021	— '047	— '009
Sikkim Himalaya and Nepal.	1-2	+ '029	— '037	+ '005	+ '045	— '010	— '023	— '006	— '039	— '024	— '039	— '063	— '048	— '018
Punjab Plain . . .	4	+ '004	— '105	+ '003	— '035	— '005	— '058	+ '006	— '052	— '011	— '021	— '038	— '041	— '029
Gangetic Plain . . .	8	+ '008	— '076	— '006	— '025	— '014	— '032	— '011	— '040	— '002	— '011	— '040	— '047	— '025
Western Rajputana . .	4	+ '026	— '097	+ '009	— '026	+ '001	— '030	— '020	— '012	— '015	— '020	— '042	— '033	— '022
Eastern Rajputana and Central India.	4-5	+ '029	— '083	+ '012	— '020	+ '001	— '023	— '016	— '013	+ '004	— '012	— '041	— '044	— '017

TABLE VI.—Geographical summary of the pressure variation data of Table II in monthly weather reviews of 1898—concl'd.

METEOROLOGICAL PROVINCE.	Number of stations	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Nerbudda Valley .	2-3	"	"	"	"	"	"	"	"	"	"	"	"	"
Chota Nagpur .	1	+ '045	- '080	+ '002	- '034	- '004	- '014	- '023	+ '007	+ '013	+ '004	- '034	- '037	- '013
Lower Bengal .	5	+ '004	- '068	- '013	- '020	- '023	- '023	- '031	- '053	- '008	- '007	- '039	- '047	- '027
Assam and Cachar .	2-3	+ '008	- '064	- '019	- '007	- '011	- '021	- '015	- '051	+ '010	+ '001	- '031	- '033	- '019
Orissa .	2	+ '009	- '067	- '028	- '020	- '023	- '040	- '013	- '046	+ '010	- '006	- '029	- '038	- '024
Central Provinces (South) and Berar.	6	+ '012	- '062	- '019	- '010	- '009	- '034	- '031	- '033	- '001	- '002	- '033	- '039	- '022
Konkan .	3	+ '044	- '062	+ '008	- '013	+ '001	- '013	- '027	+ '006	+ '009	- '008	- '028	- '031	- '010
Malabar Coast .	1	+ '019	- '048	- '021	- '017	0	- '010	- '034	+ '027	- '021	- '027	- '040	- '026	- '017
Deccan, Hyderabad and Mysore.	10	+ '017	- '042	- '013	- '009	- '010	- '008	- '031	+ '011	- '019	- '028	- '036	- '025	- '016
Eastern Coast and Carnatic.	4-5	+ '029	- '058	- '005	- '014	- '008	- '009	- '033	+ '017	- '014	- '015	- '039	- '026	- '015
Arakan and Pegu .	4	+ '025	- '064	- '011	- '015	- '017	- '020	- '041	+ '003	0	- '009	- '035	- '017	- '017
Bay Islands .	1-2	+ '004	- '081	- '041	- '008	- '025	- '038	- '024	- '026	+ '012	- '011	- '036	- '022	- '025
Extra-Tropical India .	40-44	+ '013	- '074	- '023	+ '007	+ '010	- '018	- '01	+ '003	+ '016	- '012	- '033	- '018	- '012
Tropical India .	31-32	+ '022	- '077	- '004	- '013	- '008	- '029	- '011	- '030	- '002	- '008	- '036	- '041	- '020
Whole India .	71-76	+ '025	- '062	- '011	- '013	- '008	- '016	- '031	+ '007	- '003	- '014	- '036	- '024	- '016
		+ '024	- '071	- '007	- '013	- '008	- '024	- '020	- '014	- '003	- '011	- '036	- '034	- '018

TABLE VII.—Variation of the mean pressure of each month of 1898 from the normal in the eleven meteorological provinces of India (derived from the data of Table I of the monthly weather reviews, 1898).

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Burma Coast and Bay Islands	"	"	"	"	"	"	"	"	"	"	"	"	"
Burma Inland .	+ '007	- '088	- '047	- '012	- '032	- '036	- '027	- '021	+ '015	- '014	- '022	- '011	- '024
Assam .	+ '006	- '078	- '020	- '003	- '032	- '032	- '009	- '027	+ '022	+ '003	- '024	- '037	- '019
Bengal and Orissa .	+ '010	- '074	- '027	- '006	- '025	- '031	- '005	- '052	+ '011	+ '009	- '024	- '047	- '022
Gangetic Plain and Chota Nagpur.	+ '008	- '075	- '022	- '006	- '016	- '024	- '015	- '050	+ '008	+ '001	- '015	- '026	- '019
Upper Sub-Himalayas .	+ '009	- '079	- '013	- '021	- '020	- '022	- '019	- '049	- '003	- '001	- '032	- '042	- '024
Indus Valley and North-West Rajputana.	+ '006	- '086	- '005	- '024	- '009	- '040	+ '005	- '040	+ '001	- '008	- '030	- '035	- '022
East Rajputana, Central India and Gujarat.	+ '012	- '111	+ '006	- '042	+ '002	- '052	+ '002	- '035	- '012	- '015	- '032	- '033	- '026
Deccan .	+ '024	- '088	+ '005	- '025	+ '005	- '026	- '014	- '003	+ '003	- '008	- '039	- '035	- '017
West Coast .	+ '037	- '064	- '001	- '018	+ '003	- '016	- '023	+ '001	+ '008	+ '001	- '021	- '025	- '010
South India .	+ '011	- '058	- '026	- '015	+ '007	- '013	- '035	+ '023	- '018	- '024	- '030	- '026	- '017
	+ '020	- '063	- '015	- '015	- '008	- '010	- '036	+ '011	- '005	- '012	- '025	- '015	- '014

I.—The cold weather period.—The mean pressure of the Indian area was in moderate excess in January and in very large defect in February.

The weather was less disturbed and drier than usual

in January. It was, on the other hand, somewhat more unsettled than usual in February in North-Western India, and the precipitation of the month was generally above the normal over the plains of India.

Pressure in both months was in slight to moderate relative excess in the Central Provinces and the north, centre and south of the Peninsula, and in slight defect in Bengal, the Gangetic Plain, Upper India and Burma. The following table gives the mean pressure anomalies in different parts of India for the period :—

PROVINCE.	PRESSURE ANOMALY.		
	January 1898.	February 1898.	Period January and February 1898.
Punjab	—'007	—'022	—'015
Sind	—'007	—'031	—'019
North-Western Provinces	—'007	—'005	—'006
Rajputana	+ '004	—'018	—'007
Central India	+ '015	—'001	+ '007
Bihar	—'013	0	—'007
Chota Nagpur	—'011	—'002	—'007
Bengal	—'014	—'001	—'008
Assam	—'007	+ '003	—'002
Berar	+ '039	+ '030	+ '035
Central Provinces	+ '022	+ '009	+ '016
Deccan	+ '012	+ '018	+ '015
West Coast	—'006	+ '019	+ '007
Madras Coast	+ '009	+ '013	+ '014
Burma	—'010	—'007	—'009
Andamans (Port Blair)	0	+ '008	+ '004
Ceylon (Colombo)	—'010	+ '011	+ '001

Pressure in January was in large relative excess at the level of the hill stations in Northern India and in moderate excess in February, and was also in considerable excess on the mean of the period. The following gives data for eight pairs of stations :—

HILL AND PLAIN STATIONS.	VERTICAL PRESSURE ANOMALY.		
	January 1898.	February 1898.	Period January and February 1898.
Leh and Lahore	+ '052	+ '009	+ '031
Murree and Peshawar	+ '044	+ '054	+ '049
Simla and Ludhiana	+ '036	+ '022	+ '029
Ranikhet and Bareilly	+ '022	+ '017	+ '020
Chakrata and Roorkee	+ '042	+ '022	+ '032
Darjeeling and Dhubri	+ '042	+ '057	+ '050
Mount Abu and Deesa	+ '023	0	+ '012
Quetta and Jacobabad	+ '083	+ '052	+ '068

The preceding data show that the vertical pressure anomalies of the period at the Himalayan stations were positive and large to moderate in amount. Weather was, as is usual with these conditions, less disturbed than usual in Northern India during the greater part of the period.

Pressure was in excess over the Indian area in January by amounts averaging + '025" for Tropical India and + '022" for Extra-Tropical India and in February was deficient by amounts averaging — '062" in Tropical India and — '077" in Extra-Tropical India.

The following data for ten meteorological provinces illustrate the local conditions in India in January and February :—

METEOROLOGICAL PROVINCE.	PRESSURE ANOMALY.		
	January 1898.	February 1898.	Period January and February 1898.
Burma Coast and Bay Islands	—'010	—'011	—'011
Assam	—'007	+ '003	—'002
Bengal and Orissa	—'009	+ '002	—'004
Gangetic Plain and Chota Nagpur	—'008	—'002	—'005
Upper Sub-Himalayas	—'011	—'009	—'010
Indus Valley and North-West Rajputana.	—'005	—'034	—'020
East Rajputana, Central India and Gujarat.	+ '007	—'011	—'002
Deccan	+ '020	+ '013	+ '017
West Coast	—'006	+ '019	+ '007
South India	+ '003	+ '014	+ '009

II.—The hot weather period.—Weather was less disturbed and much drier than usual in March over Northern India. Four storms of the cold-weather type formed in Persia during the month, but decreased in intensity and importance as they advanced eastwards, and hence affected weather very slightly in Upper India. April was abnormally dry over the whole of Northern and Central India, and more especially in Cachar, which usually receives moderate to heavy rain in April. May was also hotter and drier than usual. A disturbance lasting from the 12th to the 15th gave moderately heavy snow on the higher elevations of the Punjab and Kashmir Himalayas.

The mean pressure of the Indian area was in moderate

defect in March and April and in slight defect in May, as is shown by the following statement :—

MONTH.	MEAN PRESSURE VARIATION.			
	Whole India.		Tropical India.	Extra-Tropical India.
	From data of Table I.	From data of Table II.		
March	-.013	-.007	-.011	-.004
April	-.017	-.013	-.013	-.013
May	-.009	-.008	-.008	-.008

Pressure averaged .013" in defect for the whole period. The following table gives the corresponding temperature variation data for the whole of India :—

MONTH.	MEAN TEMPERATURE VARIATION FROM DATA OF TABLE II.		
	Whole India.	Tropical India.	Extra-Tropical India.
March	+0.5	+0.2	+0.6
April	+2.5	+1.2	+3.4
May	+0.6	+0.6	+0.5

Temperature was in excess in each month by amounts approximately proportional to the deficiency in the mean pressure amounts.

The following gives the local pressure variations or anomalies for each month and for the whole period in each of the eleven meteorological provinces :—

METEOROLOGICAL PROVINCE.	PRESSURE ANOMALY.			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Burma Coast and Bay Islands	-.034	+.005	-.023	-.017
Burma Inland	-.007	+.014	-.023	-.005
Assam	-.014	+.011	-.016	-.006
Bengal and Orissa	-.009	+.011	-.007	-.002
Gangetic Plain and Chota Nagpur	0	-.004	-.011	-.005
Upper Sub-Himalayas	+.008	-.007	0	0
Indus Valley and North-West Rajputana.	+.019	-.025	+.011	+.002
East Rajputana, Central India and Gujarat.	+.018	-.008	+.014	+.008
Deccan	+.012	-.001	+.012	+.008
West Coast	-.013	+.002	+.016	+.002
South India	-.002	+.002	+.001	0

The above data show that the anomalies of the pressure distribution in India were similar in character in March and May, and were opposite in character in April, but

were small in amount. Hence the mean anomalies of the period were similar to those of March and May, but less in amount. The chief features were—

(1) A slight relative deficiency of pressure in Northern India, Burma and the adjacent parts of the Bay, on the whole greatest in Lower Burma and the Andaman Sea.

(2) A slight relative excess of pressure in Sind, North Bombay, the Konkan, Rajputana, Central India, Berar, the Central Provinces, the southern half of the Bay and the Peninsula, most marked in the Deccan, East Rajputana, Central India and Gujarat.

An interesting feature of the pressure distribution of the period was the vertical pressure anomalies. They were positive throughout the whole period for the hill stations in Northern and Central India. They were small in March, large in April and moderate to small in May. On the mean of the period they were positive and large.

The following gives the vertical pressure anomalies as determined from the pressure variations of eight pairs of stations in Northern and Central India :—

HILL AND PLAIN STATIONS.	VERTICAL PRESSURE ANOMALY.			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Quetta and Jacobabad	+.012	+.083	+.012	+.036
Leh and Lahore	-.024	+.097	+.003	+.025
Murree and Peshawar	+.017	+.070	+.011	+.033
Simla and Ludhiana	+.017	+.062	+.009	+.029
Ranikhet and Bareilly	+.019	+.046	+.005	+.023
Darjeeling and Dhubri	+.038	?	+.026	?
Mount Abu and Deesa	+.001	+.007	-.027	-.006
Pachmarhi and Hoshangabad	+.005	?	+.006	?

A comparison of the vertical pressure anomalies of the period with the temperature variations will show that excess or positive values of the one accompanied positive values of the other, and that they were roughly proportional. This is shown more clearly by the following statement :—

MONTH.	Mean vertical pressure anomaly (Murree, Simla, and Ranikhet). (a)	Mean temperature variation (North-Western Provinces and Punjab). (b)	Ratio of (a) to (b).
March	+.018	-.06*	-.03
April	+.059	+3.4	.02
May	+.008	+0.3	.03
Mean of period	+.028	+1.0	.03

* Punjab plains (vide Table II) +0.7.

The pressure anomalies of the month of May were slight to moderate in amount, and were such as usually accompany the prevalence of increased temperature and exaggerated hot weather conditions in Northern India antecedent to the rains.

The following states more fully the chief abnormal features of the pressure conditions of May 1898.

The mean pressure of the Indian area was slightly below the normal ('009"). Pressure was, relatively to the general condition, in slight defect in North-Eastern India, the Carnatic and Burma and in moderate defect in Tenasserim and the Andaman Sea. Pressure was, relatively to the general condition, in excess in the remainder of the country. The excess was most marked in Sind, Kathiawar, South-West Rajputana and the Konkan. This general contrast of conditions between Tropical and Extra-Tropical India, it may be noted, almost invariably obtains in years with more strongly marked hot weather conditions (following milder winters than usual in the Western Himalayas).

The following gives data for stations in the areas of greatest excess and deficiency of pressure :—

AREA OF GREATEST DEFICIENCY OF PRESSURE.			AREA OF GREATEST EXCESS OF PRESSURE.		
STATION.	Variation of mean 8 A. M. pressure of month of May from normal.	Anomaly.	STATION.	Variation of mean 8 A. M. pressure of month of May from normal.	Anomaly.
Tavoy . . .	—'047	—'038	Hyderabad (Sind).	+ '019	+ '028
Kindat . . .	—'045?	—'036?	Kurrachee . . .	+ '015	+ '024
Moulmein . . .	—'038	—'029	Deesa . . .	+ '018	+ '027
Rangoon . . .	—'038	—'029	Rajkot . . .	+ '016	+ '025
Thayetmyo . . .	—'030	—'021	Indore . . .	+ '016	+ '025
Darbhangha . . .	—'037	—'028	Khandwa . . .	+ '014	+ '023
			Amraoti . . .	+ '013	+ '022
			Ratnagiri . . .	+ '018	+ '027
			Goa . . .	+ '025	+ '034
			Belgaum . . .	+ '023	+ '032

III.—The south-west monsoon period.—The south-west monsoon currents were established in the Arabian Sea slightly later than usual. They began to give heavy rain on the Konkan coast from the 9th or 10th, and were very strong until the 17th or 18th, when they fell off considerably in strength and were feeble until the 27th or 28th. The humid current advanced very rapidly across the north of the Peninsula, Central India and Rajputana and these

districts received rain from the 10th or 11th. In the East Punjab the rains commenced on the 15th. The humid current withdrew temporarily from Upper India on the 19th and from Central India and the Deccan on the 21st.

The Bay current was established at the head of the Bay on the 11th and 12th, and advanced rapidly up the Gangetic Plain on the 13th, 14th and 15th. It withdrew from the North-Western Provinces on the 21st and Bengal on the 25th. The monsoon currents strengthened rapidly on the 27th and 28th, and both branches were fairly strong and steady during July when nearly the whole of India received normal or slightly heavier rain than usual. The Bombay current was feeble than usual in August, and was chiefly determined across Central India and the head of the Peninsula. The Bay current was of normal strength, and gave abundant rain to Burma and North-Eastern India. Both currents were of about normal strength in September, but the Bombay current was directed more largely than usual to the Peninsula, and hence the Punjab and Rajputana had, as in August, considerably less rain than usual.

The following gives the chief features of the pressure conditions during the period from July to September :—

(1) The advance of the monsoon currents in June temporarily reversed the pressure anomalies, as is usually the case, and the pressure anomalies of June were hence generally opposite in sign to those of May.

(2) Pressure was in moderate defect in the Indian area from June to August, and normal in September.

The following gives data :—

MONTH.	MEAN VARIATION OF PRESSURE FROM NORMAL.		
	Extra-Tropical India.	Tropical India.	Whole India.
June	—'029	—'016	—'024
July	—'011	—'031	—'020
August	—'030	+ '007	—'014
September	—'004	—'003	—'004

(3) The pressure anomalies varied considerably from month to month throughout the period, and were related to the general distribution of the rainfall. For example, they were negative and moderate in amount in Upper India in June and August. They were positive and considerable in amount in the Konkan and West Deccan in August, and hence associated with a feeble monsoon than usual on the Bombay Coast.

Pressure was also in the same month in considerable local defect in Bengal and Assam, thus determining an increased flow of the monsoon currents to that area.

Pressure was locally in moderate to considerable defect in the southern half of the Peninsula in July and September, in both of which months that area received favourable rain. The anomalies hence varied considerably from month to month and on the mean of the whole period they were very small in amount. The following gives comparative data for Northern India :—

AREA.	PRESSURE ANOMALY.				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Burma	—'011	—'003	—'005	+ '016	—'001
Bengal	0	+ '005	—'035	+ '004	—'006
Orissa	—'001	—'014	—'013	+ '013	—'004
Bihar	+ '006	—'003	—'035	—'012	—'011
Chota Nagpur . .	—'001	—'017	—'029	—'008	—'014
North-Western Pro- vinces and Oudh.	—'003	+ '011	—'017	+ '003	—'001
Rajputana . . .	—'003	+ '007	+ '021	0	+ '006
Central India . .	+ '011	+ '003	+ '004	+ '006	+ '006
Punjab	—'025	+ '026	—'027	—'010	—'009

Pressure was hence on the mean of the period in slight defect in North-Eastern India and in slight excess in Rajputana and Central India.

In the following table comparative data are given for the Peninsula :—

AREA.	PRESSURE ANOMALY.				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Central Provinces .	+ '009	—'003	+ '015	+ '014	+ '009
Berar	+ '017	—'003	+ '035	+ '013	+ '015
Gujarat	—'002	—'002	+ '036	—'005	+ '007
West Coast . . .	+ '012	—'017	+ '043	—'020	+ '004
Bombay, Deccan .	+ '003	—'005	+ '036	—'007	+ '007
Madras Deccan . .	+ '014	—'012	+ '038	—'011	+ '007
Madras Coast . .	+ '018	—'018	+ '030	+ '009	+ '010
Mysore	+ '010	—'018	+ '033	—'022	+ '001
South India . . .	+ '013	—'022	+ '029	—'019	0

(4) The vertical pressure anomalies were throughout small and positive in North-Western India in July and September, but considerable in amount in June and

August. The following gives data for six pairs of stations :—

PAIR OF STATIONS.	VERTICAL PRESSURE ANOMALY.				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Leh and Lahore . . .	+ '074	—'003	+ '054	+ '011	+ '034
Murree and Peshawar . .	+ '052	+ '002	+ '034	—'022	+ '016
Quetta and Jacobabad . .	+ '052	+ '015	+ '039	+ '020	+ '031
Simla and Ludhiana . .	+ '035	+ '007	+ '036	+ '009	+ '022
Darjeeling and Dhubri . .	+ '013	—'002	+ '015	—'036	—'002
Mount Abu and Deesa . .	—'007	—'012	—'020	—'018	—'014

IV.—The retreating south-west monsoon period.—The chief features of this period were deficient rainfall in Burma and abundant and favourable rain over the southern half of the Peninsula. A storm which formed in the Bay in the second week of the month of October advanced by a curved path through the Circars, Ganjam and Orissa into South-West and Central Bengal. It gave very heavy rain in North Madras, Bengal and Assam and moderate rain in Bihar and Chota Nagpur. This was the last general rain received in North-Eastern India from the south-west monsoon of 1898. The date of the termination of the rains in that area was the 16th October and in Burma was the 22nd of October. Madras received moderate to heavy rain in the last week of the month. Unusually dry and clear weather obtained in North-Western India during the month. The pressure conditions were probably normal at the termination of the rains in Bengal, but abnormal features developed in the fourth week of the month which were remarkably persistent during the remainder of the period. The chief abnormal features of the pressure conditions initiated at that time were :—

(1) Relatively high pressure in Lower Burma, the Andaman Sea and the south-east of the Bay.

(2) Relative deficiency of pressure in North-Western India and in the south and west of the Peninsula.

(3) Slight excess of pressure in the Deccan.

With these three features were associated (1) scanty rain in Tenasserim and the Andamans, (2) deficient rain in the interior of the Peninsula, (3) fewer cyclonic storms than usual, and (4) heavy rain in the coast districts of Madras and in the interior districts of South Madras and in Mysore.

Burma was practically rainless in November and December and the rains ceased in that area in the fourth week of October from which date the humid current in the Bay was determined chiefly to Southern India.

The following table gives the pressure anomalies in the eleven meteorological provinces for each month of the period and for the whole period :—

METEOROLOGICAL PROVINCE.	PRESSURE ANOMALY.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Burma Coast and Bay Islands	—'008	+ '004	+ '019	+ '005
Burma Inland	+ '009	+ '002	—'009	+ '001
Assam	+ '015	+ '002	—'019	—'001
Bengal and Orissa	+ '007	+ '011	+ '002	+ '007
Gangetic Plain and Chota Nagpur	+ '005	—'006	—'014	—'005
Upper Sub-Himalayas	—'002	—'004	—'007	—'004
Indus Valley and North-West Rajputana	—'009	—'006	—'005	—'007
East Rajputana, Central India and Gujarat	—'002	—'013	—'007	—'007
Deccan	+ '007	+ '005	+ '003	+ '005
West Coast	—'018	—'004	+ '002	—'007
South India	—'006	—'001	+ '013	+ '002

The following gives the chief abnormal features of the period :—

(1) Pressure was in moderate defect over the whole Indian area in November and December and in slight defect in October. The following gives data :—

AREA.	MEAN VARIATION OF PRESSURE FROM NORMAL.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Extra-Tropical India	—'004	—'036	—'041	—'027
Tropical India	—'014	—'036	—'024	—'025
Whole India	—'008	—'036	—'034	—'026

(2) Pressure was, as stated above, in local excess in the south-east of the Bay, the Andaman Sea and Lower Burma during the whole of the period from about the middle of October to December. This feature is shown by the data of the stations given below :—

STATION.	PRESSURE ANOMALY.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Port Blair	—'005	+ '012	+ '029	+ '012
Tavoy	—'028	—'001	+ '023	—'002
Moulmein	—'019	—'010	+ '017	—'004
Rangoon	—'010	0	+ '015	+ '002
Diamond Island	—'001	—'004	+ '026	+ '007
Akyab	+ '003	+ '018	+ '014	+ '012

The local excess in that area was slight to moderate in amount, but was very persistent and was evidently directly related to the abnormal features of the weather of the period and of the rainfall distribution.

(3) Pressure was throughout the same period in local excess, relatively to the remainder of India, in the east and north of the Peninsula, including the Central Provinces and Berar. This is indicated by the following comparative data :—

AREA.	PRESSURE ANOMALY.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Berar	+ '008	+ '007	+ '009	+ '008
Central Provinces	+ '014	+ '009	+ '002	+ '008
Madras (East Coast, North).	+ '014	+ '027	+ '027	+ '023
Madras (East Coast, South).	—'009	—'001	+ '012	+ '001

(4) Pressure was in slight to moderate relative defect in November and December in North-Western and Central India.

(5) Pressure was in slight relative defect in October and November in Southern India.

(6) A noteworthy feature of the period was the slight to considerable excess of pressure in the Persian area which was apparently related to conditions in Southern Europe and Asia Minor and not to conditions in India :—

STATION.	VARIATION OF PRESSURE FROM NORMAL.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Baghdad	+ '033	+ '002	+ '039	+ '025
Bushire	—'004	—'020	+ '035	+ '004
Aden	—'010	—'050	—'004	—'021

(7) The vertical pressure anomalies were generally positive and small in amount throughout the period. They were hence of only slight significance. The following gives the vertical pressure anomalies as determined from the pressure variations of six pairs of stations :—

PAIR OF STATIONS.	VERTICAL PRESSURE ANOMALY.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
	"	"	"	"
Quetta and Jacobabad .	+ '034	+ '033	+ '009	+ '025
Murree and Peshawar .	+ '002	— '002	— '026	— '009
Simla and Ludhiana .	+ '010	+ '015	+ '002	+ 009
Ranikhet and Bareilly .	+ '010	+ '020?	+ '015	+ '015 ?
Darjeeling and Dhubri .	— '010?	— '021	— '006	— '012?
Mount Abu and Deesa .	0	+ '009	— '007	+ '001

The following gives a statement of the cyclones and more important cyclonic storms which affected the Indian area during the south-west monsoon of 1898, drawn up in the form adopted in the Annual Reports of the Meteorology of India for the years 1886—90. The tracks of ten of these storms are charted in plate VI :—

No.	Month.	Date.	Greatest observed barometric depression.	Character of storm.	Details of storm.
1	May .	5th to 8th	'73"	Severe cyclonic storm.	This storm formed in the South Andaman Sea in front of the first temporary advance of humid south-west winds over the south-east of the Bay. It intensified rapidly on the 5th, and marching north-westwards passed out into the Bay. It was central to the west of Diamond Island in Long. 92° E. at 8 A.M. of the 6th and in about Lat. 18½° N. and Long. 91° E. at noon of the 7th. It apparently recurved to north-east during the afternoon and evening and broke up as a distinct cyclonic circulation against the Arakan hills. The S. S. <i>Kohinur</i> which passed through the storm area on the 7th experienced winds of hurricane force. The storm which was similar in its origin and character to the storms of April 1894 and May 1897 gave a general and moderate to heavy burst of rain to Burma from the 6th to the 10th or 11th.

No.	Month.	Date.	Greatest observed barometric depression.	Character of storm.	Details of storm.
2	May and June.	31st May to 3rd June.	'32"	Cyclonic storm of moderate or considerable intensity.	This storm was generated in the centre of the Arabian Sea in front of the first advance of the monsoon current on the 30th and 31st of May. It marched northwards to the Gulf of Oman and occasioned heavy rain and destructive winds at Muscat and on the Mekran coast which inflicted much damage on property and wrecked many native craft. The vessels passing through the storm experienced very stormy weather and winds of force 8 to 10. The track of this storm is not given in Plate VI.
3	June .	12th to 20th	'24"	Cyclonic storm of moderate intensity.	This storm formed in front of the advancing humid current in the north-west of the Bay on the 12th and 13th. It moved slowly northwards, the centre passing over or near to Puri and False Point on the 15th. It thence marched very slowly through South-West and Central Bengal on the 16th, 17th and 18th, passed into North Bengal on the 19th and 20th and broke up at the foot of the Sikkim Hills. The storm, it may be noted, marched very slowly along a somewhat unusual track and was unchanged in character during its advance through Bengal quite up to the foot of the hills, being almost unique in this respect. The strongest winds experienced during its existence in the Bay were of force 10.
4	July .	1st to 8th	'21"	Cyclonic storm of moderate intensity.	This storm was generated at the head of the Bay and in South Bengal on the 1st and 2nd. It began to march slowly westwards during the next 24 hours and passed through Chota Nagpur on the 3rd and 4th into Baghelkhand and the north-eastern districts of the Central Provinces on the 5th. It thence continued to drift along a west-by-north track during the day and was central in about Lat. 24½° N. and Long. 77½° E. at 8 A.M. of the 6th and to the north-north-west of Mount Abu at 8 A.M. of the 7th. It then passed into Sind and broke up against the hills in Southern Baluchistan during the next 24 hours. It gave moderate to heavy rain to the area traversed by it. The strongest winds in the Bay were only of force 6.
5	July	21st to 26th	'24"	Cyclonic storm of moderate intensity.	This storm originated in the Bay off the Circars Coast on the 21st. It intensified slowly during the next three days and was of moderate intensity on the 24th. It was stationary during that period, but began to advance westwards on the 25th and at the same time to fill up. The centre marched across the coast near Vizagapatam on the evening of the

No.	Month.	Date.	Greatest observed barometric depression.	Character of storm.	Details of storm.	No.	Month.	Date.	Greatest observed barometric depression.	Character of storm.	DETAILS OF STORM.
					<p>25th. It thence drifted westwards through the eastern districts of Hyderabad and of the Central Provinces on the 20th and broke up in that area during the next 24 hours.</p> <p>The storm was an example of a class of occasional occurrence, <i>vis.</i>, storms which form in the Bay, gradually develop and attain moderate intensity and then decrease on approaching land and break up either before reaching the coast or very shortly after crossing it. The strongest winds experienced by vessels in the Bay during its existence were of force 6.</p> <p>The track of this storm is not given in Plate VI.</p>						
6	August	7th to 12th	"26"	Cyclonic storm of moderate intensity.	<p>This storm was generated in the north-west of the Bay on the 7th. It increased slowly in intensity on the 8th and 9th. It began to move in a north-westerly direction and passed through South-West Bengal on the 10th, Chota Nagpur and South Bihar on the 11th, and filled up in North Bihar on the 12th and 13th.</p> <p>The storm gave a moderate to heavy burst of rain in South-West Bengal, Orissa, Chota Nagpur, Bihar and the eastern districts of the North-Western Provinces.</p> <p>The strongest winds reported by vessels in the Bay during the existence of the storm were of force 10.</p>	9	September.	19th to 23rd	"14"	Cyclonic storm of feeble intensity.	<p>Very heavy rain occurred in Orissa, Chota Nagpur, Bihar and Bengal during the progress of the storm and exceptionally heavy rain in the Sonthal Parganas and the submontane districts of Bihar and Bengal whilst it was breaking up. The strongest winds in the Bay were of force 9.</p> <p>This storm was generated in the north of the Bay on the 19th. It drifted north-westwards and passed through North Orissa and South-West Bengal on the 20th, Chota Nagpur on the 21st, the eastern districts of the North-Western Provinces on the 22nd and the central districts of the North-Western Provinces on the 23rd and disappeared during the next 24 hours.</p> <p>The disturbance was throughout feeble and of little importance.</p>
7	August	20th to 23rd	"16"	Feeble cyclonic storm.	<p>This storm which was very remarkable in several respects appeared or formed in Upper Burma on the 20th. It passed into South-East Bengal on the 21st, through South-West Bengal and Chota Nagpur into the eastern districts of the Central Provinces on the 22nd and the north-eastern districts of the Central Provinces on the 23rd where it filled up rapidly during the day.</p> <p>The storm occasioned a very heavy burst of rain in the Central Provinces.</p>	10	October	9th to 15th	"47"	Cyclonic storm of considerable intensity.	<p>This storm formed in the centre of the Bay nearly midway between the Andamans and the Circars Coast on the 8th and 9th. It intensified rapidly on the 10th and commenced to move west-north-westwards towards the Circars Coast which it crossed a little to the south of Masulipatam about 9 or 10 A.M. of the 11th. It continued to drift in the same direction and passed over Bezvada about 1 P.M. It then recurved rapidly and advanced north-eastwards along the eastern flank of the East Ghats during the next two days. It passed into South-West Bengal on the 14th at 8 A.M. of which day it was central near Midnapore. The centre continued to march in the same direction during the next 24 hours and was to the north-west of Sirajganj at 8 A.M. of the 15th. It broke up rapidly during the day.</p> <p>The storm resembled in its chief features the Vizagapatam cyclone of 1876 and was noteworthy for the excessive burst of rain which accompanied it. The <i>F. L. V. Torch</i> experienced winds of force 10 on the 13th.</p>
8	Sept.	11th to 16th	"44"	Cyclonic storm of considerable intensity.	<p>This storm formed in the north-west of the Bay on the 10th. It developed slightly on the 11th and 12th and rapidly during the next 24 hours. It marched slowly northward and was central a little to the west of False Point at about 8 A.M. of the 13th and near and to the west of Shortt's Island about 5 P.M. It passed through North Orissa and Chota Nagpur on the 14th and South Bihar on the 15th into North Bihar on the 16th where it filled up during the next 24 hours.</p>	11	November.	4th to 12th	About "65"	Severe cyclonic storm.	<p>This storm formed rapidly in the south-west of the Bay on the 4th and 5th and began to travel west-north-westwards on the morning of the 5th. The centre crossed the Coromandel Coast between 3 A.M. and 4 A.M. of the 6th, 20 or 30 miles to the south of Madras. It continued to drift across the Peninsula during the next 48 hours, at the same time filling up considerably. It passed out into the Arabian Sea as a feeble residual depression on the morning of the 8th. It was a feeble disturbance during the next 36 hours, but</p>

No.	Month.	Date.	Greatest observed barometric depression.	Character of storm.	Details of storm.	No.	Month.	Date.	Greatest observed barometric depression.	Character of storm.	Details of storm.
					when it had advanced well into the open sea, it re-developed rapidly and was a severe storm on the 10th and 11th. The centre was apparently in about Lat. 13° N. and Long. 65½° E. at 8 A.M. of the latter day. The vessels within the central area experienced cyclonic winds of force 8 to 12. The storm filled up almost completely on the 12th.						
The following is a similar statement of the most important land-formed depressions generated in the plains of Bengal during the south-west monsoon of 1898 :—											
1	July	16th to 20th	"15"	Land-formed depression of slight intensity.	This land-formed depression was generated in Central Bihar on the 16th in an area of heavy local rainfall. It drifted westwards during the next 24 hours into the eastern districts of the North-Western Provinces. It continued to travel in the same westerly direction through the south-western districts of the North-Western Provinces on the 18th and Rajputana on the 19th	2	August	13th to 17th	"12"	Land-formed depression of feeble intensity.	and 20th and broke up during next 24 hours against the Baluchistan hills. The storm occasioned moderate to heavy general rain in the Gangetic Plain and Rajputana and heavy local downpours in Lower Sind and Baluchistan. This depression originated in East Bengal on the 13th. It drifted across Central Bengal into South Bihar on the 15th and into the south-eastern districts of the North Western Provinces on the 16th and filled up during the next 36 hours. The storm gave very heavy rain in East and Central Bengal and moderately heavy rain in Bihar and the adjacent districts of the North-Western Provinces.
						3	August	26th to 31st	"17"	Land-formed depression of slight intensity.	This depression formed in East Bengal on the 25th. It was almost stationary from the 26th to the 28th. It began to move westwards during the 28th and was in West Bengal on the 29th, the western districts of Chota Nagpur and the eastern districts of the North-Western Provinces on the 30th and in Baghelkhand and Bundelkhand on the 31st and filled up during the next 24 hours. The disturbance determined moderate to heavy rain to Bihar, Chota Nagpur, Central India and the Central Provinces.

Winds.

The mean direction of the wind and the mean diurnal movement of the air, as measured by Robinson anemometers, are given for all second class stations in Table II in each monthly review. The normal values are also stated for the sake of ready comparison. The normal data of these elements utilized in Table II of the monthly weather reviews of the year 1898, will be found in a collected form in Tables XI and XII of the Annual Summary for 1896 (pages 638 to 644). The mean 8 A.M. wind directions for each month are laid down in the first chart in each monthly review. They are calculated in the usual manner by Lambert's formula from the 8 A.M. wind data given in Table I in each monthly review. As a general rule, the mean 8 A.M. wind directions vary little from the mean wind directions (calculated from the 10 and 16 hours wind data) in Table II of each monthly review, but in some cases and at certain seasons of the year they differ very considerably.

The chief features of the air movement over India in 1898 have been described in the monthly reviews of the year. The following gives a summary of the most important features for each period :—

I.—The cold weather period.—This period was less disturbed than usual in Northern India, more especially in January. The winds at the hill stations in Northern India were generally considerably above their normal strength both in January and February. The following gives data in illustration :—

STATION.	MEAN DAILY AIR MOVEMENT IN MILES.					
	Actual, January 1898.	Normal, January.	Percentage variation from normal, January 1898.	Actual, February 1898.	Normal, February.	Percentage variation from normal, February 1898.
Murree	172	220	—22	218	218	•
Chakrata	217	123	+76	205	134	+53
Ranikhet	87	44	+98	98	57	+72
Darjeeling	?	88	?	116	137	—15
Mount Abu	123	119	+ 3	226	140	+61
Pachmarhi	93	78	+19	164	98	+67

Winds were on the mean of the month somewhat feebler than usual in January and stronger in February in the plains of Northern India and were on the mean of the period of normal strength and steadiness, as is shown by the following data:—

PROVINCE.	MEAN WIND STEADINESS DURING COLD WEATHER PERIOD.			MEAN DAILY AIR MOVEMENT IN MILES DURING COLD WEATHER PERIOD.		
	Actual, percentage, 1898.	Normal percentage.	Variation from normal.	Actual, 1898.	Normal.	Percentage variation from normal.
Bengal	41	36	+ 5	83	83	0
Bihar	28	48	—20	70	72	—3
Chota Nagpur	53	52	+ 1	197	154	+28
North-Western Provinces and Oudh.	34	34	0	79	67	+18
Punjab	20	22	—2	48	50	—4
Rajputana	28	23	+ 5	117	119	—2

Local sea winds set in later in South Bengal and Orissa than usual. The mean wind directions of the month of February for Cuttack, Calcutta and Narayanganj hence contained a northerly instead of the normal southerly component.

Winds were steadier than usual on the mean of the period in Berar, Central India and the Central Provinces. The following gives data in illustration:—

PROVINCE.	PERCENTAGE OF MEAN WIND STEADINESS.			
	January 1898.	February 1898.	Period January and February 1898.	Variation from normal of period January and February 1898.
Central India.	66	35	50	+15
Berar	36	29	33	+10
Central Provinces	31	21	26	+ 4

The air movement in Berar, the Central Provinces and on the Bombay and Madras coasts was slightly feebler than usual in January and slightly stronger in February (except on the Madras coast) and was on the mean of the period normal. It was, on the other hand, somewhat stronger in both months in the Deccan.

The following gives comparative data showing the variations of the intensity or amount of the diurnal air movement from the normal in the Peninsula during this period:—

PROVINCE.	MEAN DAILY AIR MOVEMENT IN MILES.				
	Actual, January 1898.	Actual, February 1898.	Mean actual of period, January and February 1898.	Mean normal of period, January and February.	Percentage variation from normal of period January and February 1898.
Central Provinces	57	102	79	77	+ 3
Berar	83	170	126	117	+ 8
Deccan	169	195	182	163	+19
Madras Coast	108	108	108	117	— 8
Mysore	174	134	154	142	+ 8
Bombay or West Coast	155	180	167	166	+ 1

II.—The hot weather period.—Weather was on the whole less disturbed than usual in March and April in the Indian area and was normal in character in Bengal and the Peninsula in May, but was more disturbed in Upper India and Burma in that month.

The hot weather conditions were more intensely marked than usual during the period in the Punjab, Sind, Rajputana, the Gangetic Plain, Central India, the Central Provinces and the North Deccan. Temperature was on the mean of the month of May most largely in excess in the South-West Punjab, Upper Sind, Chota Nagpur, South Bihar, Cachar, Berar and the western districts of the Central Provinces. The chief features of the air movement of the period were:—

1st.—Winds were slightly stronger and considerably steadier and much more westerly than usual (more especially in May) in the interior of Bengal and as usual under these conditions less westerly at the coast stations. The following gives data showing the actual deflection:—

STATION.	WESTERLY DEFLECTION.			
	March, 1898.	April, 1898.	May, 1898.	Period March to May, 1898.
Calcutta	0	0	0	0
Burdwan	+52	+13	+19	+28
Berhampore . . . . .	...	+22	+10	...
Narayanganj	+10	—11	+35	+11
Saugor Island	—7	—4	+ 3	—3
False Point	—16	—19	—30	—22
	—45	—17	—11	—24

- 2nd.—Winds were stronger than usual in the North-Western Provinces and Chota Nagpur, the increased force being pronounced in March and April.
- 3rd.—Winds were of normal steadiness in the Punjab and on the whole somewhat feebler than usual.
- 4th.—Winds were also, on the whole, somewhat feebler and more westerly than usual in Rajputana.
- 5th.—Winds from northerly directions were much more frequent than usual in April and May at the hill stations in Northern India.
- 6th.—Winds were stronger than usual throughout the period in Berar. They were, on the other hand, of normal strength in the Central Provinces in April and May and somewhat feebler than usual in March. Winds were on the whole somewhat more easterly in these areas than usual, more especially in March. They were also abnormally unsteady in March.
- 7th.—Winds were also stronger than usual in the Bombay Deccan and Mysore.
- 8th.—Winds were throughout the period practically normal in strength and direction in the Madras and Bombay coast districts.

The following gives data showing the percentage variation of the air movement, month by month, from the normal during this period in Northern and Central India :—

PROVINCE.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT IN		
	March 1898.	April 1898.	May 1898.
Bengal	-14	+11	+5
Bihar	-17	-1	+14
Chota Nagpur	+22	+6	0
North-Western Provinces and Oudh .	+18	+10	+9
Punjab	-13	-22	-11
Rajputana	+1	-10	0
Central India	-12	-24	-15

The following gives data showing the percentage variation of the air movement from the normal, month by month, in the Peninsula :—

PROVINCE.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT IN		
	March 1898.	April 1898.	May 1898.
Berar	+4	+10	+6
Central Provinces	-13	0	-2
Bombay Deccan	+1	+3	+12
Madras Deccan	-31	+3	+7
Mysore	+23	+4	-10
Bombay Coast	-12	-6	-7
Madras Coast	-21	-1	-4

The air movement in Northern India in May immediately antecedent to the advent of the monsoon was the ordinary hot weather circulation slightly strengthened and modified in direction by the abnormal temperature and pressure conditions which prevailed throughout nearly the whole hot weather period in Northern India.

III.—The south-west monsoon period.—The Arabian Sea current was slightly delayed and was not established on the Malabar coast until the 9th and the Konkan coast until the 10th of June. It advanced with great rapidity into the interior and gave general rain to the west and centre of the Central Provinces and Central India, on the 10th, to Rajputana, on the 11th and to the South-East Punjab on the 15th. The advance of the current over the Arabian Sea was made somewhat more quickly than usual. A cyclonic storm formed in the centre of the Arabian Sea on the 30th and 31st of May and advanced northwards to Muscat and the Mekran coast. The south-west monsoon current was established in the Bay during the second week of June. A cyclonic storm of moderate intensity formed in front of its advance. This storm marched northwards across the Orissa coast on the 15th and passed through South-West and Central Bengal into North Bengal where it broke up.

The first burst of the monsoon current was not so strong as usual and withdrew gradually from Northern and Central India in the fourth week of June. The break in the rains thus initiated held until the 28th or 29th. The monsoon currents were somewhat less steady than usual in July, more especially the Bay current. They were very steady in August and September and withdrew from Upper India in the third week of the latter month.

The comparative data in the table below based upon the anemometric observations of four coast and four inland stations under the influence of the two currents give

an approximate estimate of the strength of the air movement of the two branches of the monsoon current :—

MONTH.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.			
	BAY OF BENGAL CURRENT.		BOMBAY CURRENT.	
	Four coast stations.	Four inland stations.	Four coast stations.	Four inland stations.
June	+14	-1	+1	+4
July	+5	+6	-18	+10
August	+31	+8	+2	+28
September	+5	+6	-4	-25
Mean of period	+14	+5	-5	+4

The data given in the above table show that the air movement varied irregularly and in opposite directions at the land and coast stations in the case of the Bombay current, but on the mean of both was practically normal. The data for the Bay current show that it was slightly stronger than usual over the whole land area to which it usually extends.

The following table gives corresponding data for the steadiness of the two currents in the coast and interior districts of India :—

MONTH.	VARIATION FROM NORMAL OF PERCENTAGE OF MEAN WIND STEADINESS.			
	BAY OF BENGAL CURRENT.		BOMBAY CURRENT.	
	Four coast stations.	Four inland stations.	Four coast stations.	Four inland stations.
June	+1	-9	+5	+5
July	-4	-7	-3	-3
August	+14	-6	+9	+9
September	+4	+2	+6	-2
Mean of period	+4	-5	+4	+2

The Bombay current was, as shown by the data, slightly steadier than usual.

The comparative data given in the following table of the mean actual and normal force of the winds derived from the meteorological information contained in the logs of vessels navigating the Indian seas indicate that the air

movement was below the normal to a moderate extent throughout the period in the Arabian Sea, and to a slight extent in the Bay of Bengal on the mean of the whole period. The actual variations are chiefly derived from vessels following four or five tracks in these seas, and hence do not necessarily indicate a variation common to the whole area. They, however, almost certainly establish that the current in the Arabian Sea was slightly below its normal strength throughout the period :—

MONTH.	MEAN DAILY FORCE OF WIND (BEAUFORT'S NOTATION) IN THE					
	BAY OF BENGAL.			ARABIAN SEA.		
	Actual, 1898.	Normal.	Variation from normal.	Actual, 1898.	Normal.	Variation from normal.
June	4'1	4'0	+0'1	4'3	4'5	-0'2
July	3'9	4'0	-0'1	4'4	4'6	-0'2
August	4'0	4'0	0	3'9	4'3	-0'4
September	3'1	3'7	-0'6	3'0	3'5	-0'5
Mean of period	3'8	3'9	-0'2	3'9	4'2	-0'3

The following gives a summary of the more important variations of the mean air movement from the normal during the first half of this period (or in June and July) when both currents were largely determined by the pressure conditions to Upper India :—

- (1) Winds were during this period more westerly than usual at Port Blair and Rangoon and on the Tenasserim Coast and were more easterly than usual in North-Eastern India. The following data show these features in the case of six typical stations :—

STATION.	INCREASED EASTING.		
	June 1898.	July 1898.	Period June and July 1898.
Port Blair	-19	-17	-18
Diamond Island	-11	+29	+9
Calcutta	+22	+14	+18
Berhampore	+2	+13	+8
Burdwan	+3	+30	+17
Rangoon	-18	0	-6

- (2) Winds were also during this period on the whole stronger than usual over Northern India, except in the Punjab, Central India and Chota Nagpur where they were slightly below their normal strength, as is shown by the following data :—

AREA.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.		
	June 1898.	July 1898.	Period June and July 1898.
Bengal	+1	+11	+6
Bihar	+2	+32	+17
Chota Nagpur	+6	-19	-7
North-Western Provinces and Oudh .	+25	+3	+14
Punjab	-7	-18	-13
Rajputana	+14	-10	+2
Central India	+3	-34	-16

- (3) Winds were, on the mean of the period, stronger than usual over the interior areas dominated by the Bombay current, *vis.*, Berar, the Central Provinces and the Deccan, as is shown by the following data :—

AREA.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.		
	June 1898.	July 1898.	Period June and July 1898.
Berar	+9	0	+5
Central Provinces	+9	-5	+2
Bombay Deccan	+23	-4	+10
Madras Deccan	+17	+12	+15

It may be noted that abnormally strong westerly winds obtained over the whole of Northern and Central India during the break in the rains from the 21st to the 24th June.

The most important feature of the first half of the period was the strong determination of the Bombay current to the Gangetic Plain and Upper India and its partial diversion from Burma, East and North Bengal and Assam. Conditions changed at the end of July and the chief features of August and September were inverse to those of the preceding two months. During the second half of the monsoon period the monsoon currents were steady and were directed more largely than usual to North-Eastern India and Burma than in the previous half. The more noteworthy features were :—

- (1) Winds were more westerly than usual at Port Blair and in Burma and North-Eastern India.

The following data for five stations are given in illustration :—

STATION.	INCREASED WESTING.		
	August 1898.	September 1898.	Period August and September 1898.
Port Blair	0	0	0
Rangoon	+14	+1	+8
Chittagong	+9	+23	+16
Calcutta	+26	+37	+32
Burdwan	+30	+24	+27
	+33	+24	+31

- (2) Winds were stronger in Bengal and the Gangetic Plain throughout the period, as is shown below:—

AREA.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.		
	August 1898.	September 1898.	Period August and September 1898.
Bengal	+27	+11	+19
Assam	+51	+18	+35
Bihar	+27	+53	+40
Chota Nagpur	+10	-2	+4
North-Western Provinces and Oudh .	+11	+11	+11

- (3) Winds were slightly above their normal intensity in Rajputana and of normal strength in the Punjab and Central India. They were also more westerly than usual in direction in both these areas. The following gives comparative data :—

AREA.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.		
	August 1898.	September 1898.	Period August and September 1898.
Punjab	-10	+7	-3
Rajputana	+35	-9	+13
Central India	+11	-24	-7

- (4) Winds were lighter and less steady than usual in the Deccan, Berar and the Central Provinces in the month of September, but steadier an

stronger than usual in August. The following data illustrate these features:—

AREA.	PERCENTAGE VARIATION FROM NORMAL OF MEAN WIND STEADINESS.			PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.		
	August 1898.	Sept. 1898.	Period August and Sept. 1898.	August 1898.	Sept. 1898.	Period August and Sept. 1898.
Berar	+10	-3	+4	+27	-23	+2
Central Provinces	+16	-4	+6	+41	-9	+16
Bombay Deccan	+5	-20	-8	+29	-3	+13
Madras Deccan	+10	-7	+2	+23	-3	+10

The following table gives the percentage variation of the strength of the winds from the normal, month by month, throughout the whole monsoon period, in different provinces:—

AREA.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.				
	June 1898.	July 1898.	August 1898.	Sept. 1898.	Period June to Sept. 1898.
Bengal	+1	+11	+27	+11	+12
Bihar	+2	+32	+27	+53	+28
Chota Nagpur	+6	-19	+10	-2	-1
North-Western Provinces and Oudh	+25	+3	+11	+11	+12
Punjab	-7	-18	-10	+13	-5
Rajputana	+14	-10	+35	-9	+7
Central India	+3	-34	+11	-24	-11
Central Provinces	+9	-5	+41	-9	+9
Berar	+9	0	+27	-23	+3
Bombay Deccan	+23	-4	+29	-3	+11
Madras Deccan	+17	+12	+23	-3	+12

The chief features of the south-west monsoon air movement were hence as follows:—

- (1) The Bay current was normal in strength throughout the greater part of the period.
- (2) It was determined in June and July over the north and centre of the Bay to a greater extent than usual to Bengal and the Gangetic Plain.
- (3) It was, on the other hand, during the months of August and September directed more largely than usual to North-Eastern India and Burma.
- (4) The Arabian Sea current was slightly weaker than usual throughout the whole season.

- (5) During the latter half of the season it was determined more largely to the Peninsula and less to Upper India than usual.

IV.—The retreating south-west monsoon period.—The south-west monsoon currents withdrew from Upper India in the third week of September, from North-Eastern India in the third week of October and from Burma in the fourth week of that month. The rains hence ceased in Upper and North-Eastern India slightly earlier than usual and in Burma considerably before their normal date. The South Deccan and Madras coast districts received moderate rain under normal conditions during the first week of October and again during the last week. A considerable change in the pressure conditions occurred in the last week of the month favourable to rain in the Madras Presidency which was more or less persistent throughout the remainder of the season. The chief abnormal features of the pressure conditions were:—1st, a slight to moderate relative defect of pressure in Southern India, and 2nd, a slight to moderate excess in the Andaman Sea, Lower Burma and Tenasserim.

The following gives the more important features of the air movement in India during this period:—

- (1) Winds were more variable and slightly weaker than usual in Burma and at Port Blair.
- (2) Winds were feebler than usual in Bengal and contained a more pronounced easterly or decreased westerly element than usual at the southern and south-eastern stations and a strong westerly component at the south-western and central stations. The following gives data showing the amount of the westerly deflection at several stations:—

STATION.	WESTERLY DEFLECTION.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Chittagong	0	0	0	0
Narayanganj	Large	-10	-16	Large
Calcutta	-19	+5	-13	-9
Saugor Island	+35	+19	+18	+24
Burdwan	+18	-2	-3	+4
Berhampore	+37	+9	+10	+19

- (3) The air movement in the Gangetic Plain and Chota Nagpur was normal in direction, but slightly stronger than usual.

(4) Winds were very feeble and unsteady in the Punjab, Central India, Rajputana and Sind.

(5) The following gives comparative data of the mean amount of the daily air movement in Northern and Central India :—

PROVINCE.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Andamans (Port Blair)	— 3	+ 7	— 23	— 6
Burma	— 8	— 1	— 19	— 9
Bengal	— 9	— 17	— 7	— 11
Assam	+ 13	— 13	— 26	— 9
Bihar	+ 24	— 15	+ 19	+ 9
Chota Nagpur . . .	— 6	— 1	+ 39	+ 11
North-Western Provinces and Oudh.. . . .	0	+ 13	+ 27	+ 13
Punjab	— 24	— 6	— 8	— 13
Rajputana	— 13	— 4	— 9	— 9
Central India . . .	— 32	— 21	— 15	— 23
Sind	— 18	— 8	— 16	— 14

(6) Winds were very unsteady in the Central Provinces and Berar in December, but of normal steadiness in October and November. They were considerably steadier than usual in the Deccan and Madras coast districts in October and practically normal in steadiness in November and December. The following gives data for seven representative stations:—

STATION.	VARIATION OF ACTUAL FROM NORMAL OF PERCENTAGE OF WIND STEADINESS.			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Nagpur	+ 7	— 18	— 45	— 19
Vizagapatam . . .	+ 23	+ 3	+ 20	+ 15
Hyderabad (Deccan) .	+ 7	0	— 7	0
Bellary	+ 23	+ 22	+ 20	+ 22
Sholapur	+ 31	— 46	+ 6	— 3
Madras	+ 36	— 7	+ 6	+ 12
Trichinopoly	— 12	— 6	+ 7	— 4

(7) Winds were more easterly than usual at the Coromandel coast stations.

(8) The following table gives variation data of the mean air movement in different parts of the Peninsula :—

DIVISION.	PERCENTAGE VARIATION FROM NORMAL OF MEAN DAILY AIR MOVEMENT.		
	October 1898.	November 1898.	December 1898.
Central Provinces	+ 10	+ 13	— 5
Berar	+ 3	+ 20	+ 18
Bombay Deccan	+ 14	+ 30	+ 17
Madras Deccan	+ 7	+ 36	+ 49
Mysore	+ 6	— 1	+ 14
Bombay Coast	— 5	+ 1	+ 5
Madras Coast	0	— 5	— 13

Humidity.

The variations of the mean monthly and annual aqueous vapour pressure and humidity values from the calculated normals for the year 1898 are given in Tables VIII and IX. The normal values employed in the determination of the variations are given in Tables XIII and XIV of the Annual Summary for the year 1896. The four tables (Tables X to XIII) give variation data of aqueous vapour

pressure and relative humidity for each month of the year and for the year :—

1st.—For eighteen meteorological areas adopted in the geographical summaries of meteorological data in the annual reports issued by the department previous to 1891.

and.—For ten meteorological provinces of the Empire.

TABLE VIII.—Comparison of the monthly mean vapour pressure data of 1898 with the averages of past years.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		"	"	"	"	"	"	"	"	"	"	"	"	"
BURMA COAST AND BAY ISLANDS.	Port Blair .	-.034	-.019	-.051	-.010	-.021	+.007	+.003	+.009	+.014	+.014	-.064	-.031	-.015
	Rangoon .	-.011	-.006	-.011	+.065	+.023	+.004	-.006	+.001	-.001	-.011	-.072	-.069	-.008
	Diamond Is- land.	+.010	+.010	-.026	-.021	-.012	+.011	+.012	+.012	+.010	+.020	-.028	-.004	-.001
	Cecos Island.	-.020	+.020	-.038	-.004	+.008	-.004	-.002	+.006	-.002	+.015	-.039	-.005	-.005
ASSAM	Akyab .	+.040	+.031	+.006	+.049	+.067	+.047	+.019	+.031	+.041	+.064	-.006	+.009	+.033
	Silchar .	-.011	-.012	-.124	-.024	-.041	-.012	0	-.012	-.006	+.006	-.040	-.006	-.024
	Sibsagar .	-.002	+.012	-.016	+.046	+.007	+.012	+.019	+.022	-.004	-.014	-.011	?	?
	Dhubri .	-.017	+.023	-.046	+.042	-.011	+.009	+.006	+.013	-.009	+.014	-.033	-.003	-.001
BENGAL AND ORISSA.	Chittagong .	?	+.056	-.003	+.065	+.045	+.054	-.006	+.010	-.016	+.024	-.060	-.034	?
	Narayanganj.	-.005	+.004	-.112	+.020	-.041	-.015	-.214	-.011	-.020	-.008	-.012	-.017	-.019
	Calcutta (Ali- pore).	-.025	-.033	-.178	+.010	-.058	-.019	-.006	-.001	-.028	-.049	-.026	+.005	-.034
	Saugor Island	-.056	-.056	-.076	-.010	-.014	-.032	-.024	-.012	-.020	-.046	-.029	+.010	-.030
	Burdwan .	0	+.034	-.084	+.058	-.033	+.005	+.004	+.020	+.009	-.001	+.019	+.016	+.003
	Berhampore .	-.014	-.007	-.155	-.020	-.082	-.001	+.002	-.001	-.006	-.028	0	-.008	-.027
	False Point .	-.058	-.070	-.034	+.036	+.027	+.001	+.013	+.014	+.021	+.033	+.028	+.087	+.008
	Cuttack .	-.092	-.074	-.134	+.043	-.012	+.012	+.019	-.010	0	-.009	-.041	+.052	-.021
GANGETIC PLAIN AND CHOTA NAGPUR.	Hazaribagh .	-.013	+.031	-.064	+.068	-.035	+.040	-.010	-.009	-.016	-.037	-.019	+.014	-.004
	Patna .	-.004	+.036	-.052	+.065	-.042	-.009	+.012	+.018	-.003	-.006	+.002	0	+.001
	Darbhanga .	+.002	+.044	+.006	+.069	-.061	+.010	+.011	+.010	-.027	-.015	+.008	+.010	+.006
	Allahabad .	-.080	+.050	-.068	+.016	+.113	+.096	+.017	-.010	-.005	-.088	-.029	-.016	0
UPPER SUB- HIMALAYAS.	Lucknow .	-.020	+.091	-.031	+.056	+.017	+.042	?	+.023	+.042	0	+.018	+.033	?
	Dera Dun .	-.031	-.011	-.030	-.019	-.076	+.060	-.008	+.012	-.014	-.006	-.036	+.021	-.012
	Roorkee .	-.038	+.023	-.040	-.028	-.067	+.068	-.020	+.017	-.018	-.016	-.022	+.013	-.011
	Meerut .	-.058	+.025	-.068	-.030	-.062	+.067	-.018	-.025	+.011	-.064	-.043	-.015	-.023
INDUS VALLEY AND NORTH- WEST RAJ- PUTANA.	Lahore .	-.012	+.039	-.006	-.004	-.016	+.073	+.050	-.012	-.012	-.058	-.052	-.030	-.003
	Ludhiana .	-.049	+.006	-.069	-.118	-.109	-.009	+.024	-.048	-.014	-.061	-.062	-.043	-.046
	Peshawar .	-.006	+.011	+.006	-.031	-.035	-.022	+.015	+.041	+.092	+.010	-.046	-.028	+.001
	Mooltan .	+.014	+.043	-.084	-.125	-.159	+.009	-.004	-.056	-.052	-.127	-.062	-.033	-.053
EASTERN RAJPUTANA, CENTRAL INDIA AND GUJARAT.	Jacobabad .	-.001	+.002	-.056	+.098	+.110	+.157	+.083	+.042	?	?	-.031	-.007	?
	Kurrachee .	+.054	-.048	-.130	+.035	+.004	-.005	-.011	-.038	-.048	-.037	-.067	-.091	-.032
	Jeypore .	-.048	+.030	-.084	-.045	-.017	+.017	-.035	-.079	0	-.118	-.058	0	-.036
	Ajmere .	-.028	+.020	-.050	-.020	+.017	+.043	+.056	-.036	+.045	-.066	+.001	+.035	+.002
	Deesa .	-.054	+.039	-.118	-.076	-.064	+.007	+.040	-.033	+.004	-.085	+.021	+.054	-.022
	Nowgong .	-.042	+.031	-.074	-.018	-.058	+.029	+.051	+.045	+.039	+.039	?	?	?
	Agra .	-.017	+.047	-.034	+.005	+.200	+.129	+.040	+.028	+.038	-.027	+.007	+.028	+.037

TABLE VIII.—Comparison of the monthly mean vapour pressure data of 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
DECCAN	Belgaum	—'112	—'023	—'045	+ '051	+ '018	+ '009	+ '011	+ '002	+ '019	+ '016	—'001	+ '033	—'002
	Skolapur	—'156	—'060	—'088	+ '005	—'021	—'043	—'009	—'041	—'006	—'068	—'049	+ '017	—'043
	Poona	—'130	+ '006	—'060	+ '015	—'024	—'027	+ '003	—'011	+ '007	—'031	—'026	+ '072	—'017
	Akola	—'122	—'021	—'033	+ '009	—'043	—'018	+ '025	—'002	+ '006	—'099	—'043	+ '038	—'025
	Buldana	—'149	—'055	—'099	—'057	—'067	—'050	—'005	—'026	—'006	—'118	—'077	+ '006	—'059
	Khandwa	—'131	—'045	—'077	—'067	—'087	—'021	+ '010	—'029	+ '022	—'058	—'017	+ '031	—'039
	Hoshangabad	—'051	+ '006	—'011	+ '005	—'029	—'041	+ '022	—'019	+ '030	—'070	—'001	+ '014	—'012
	Nagpur	—'131	+ '010	—'054	—'005	—'011	+ '012	+ '012	—'023	+ '017	—'079	—'039	+ '028	—'022
	Jubbulpore	—'059	+ '017	—'023	+ '073	—'023	+ '008	—'006	—'034	+ '028	—'047	—'007	+ '041	—'003
	Saugor	—'103	—'001	—'034	+ '128	?	+ '105	+ '013	—'025	+ '009	?	?	+ '007	?
	Sutna	—'040	+ '028	—'032	—'001	—'037	+ '141	+ '062	+ '023	+ '039	—'049	+ '009	+ '039	+ '015
	Raipur	—'099	—'017	—'085	—'055	—'100	—'025	—'002	—'028	—'004	—'070	—'049	+ '030	—'042
WEST COAST	Hyderahad (Deccan).	—'105	—'043	—'077	?	—'032	—'040	+ '032	—'024	—'001	—'019	—'019	+ '052	?
	Bombay	—'033	—'027	—'044	+ '005	—'016	—'016	—'025	—'028	—'011	—'006	+ '002	+ '016	—'015
	Ratnagiri	—'132	—'027	—'022	+ '021	+ '003	+ '024	+ '002	+ '010	+ '016	+ '016	—'003	+ '080	—'001
	Karwar	—'079	—'041	+ '030	+ '008	—'014	—'002	—'008	—'016	—'010	+ '020	+ '001	+ '035	—'006
	Cochin	—'045	+ '008	—'028	+ '017	+ '009	+ '010	—'001	+ '013	—'004	+ '018	—'025	—'026	—'005
	Salem	—'011	+ '044	—'077	?	+ '025	+ '004	—'015	—'027	+ '020	+ '020	+ '036	+ '046	?
	Mercara	—'093	—'009	—'078	+ '002	+ '007	+ '006	+ '006	0	+ '019	+ '021	—'013	—'018	—'011
	Ghitaldroog	—'023	+ '004	—'076	+ '027	+ '012	+ '003	+ '030	—'009	+ '044	+ '058	+ '033	+ '036	+ '012
	Bangalore	—'033	+ '008	—'112	—'008	—'010	—'003	—'006	—'027	+ '035	+ '021	+ '022	+ '035	—'007
	Hassan	—'070	—'033	—'116	—'039	+ '004	+ '014	+ '027	—'005	+ '040	+ '034	—'011	—'013	—'014
	Mysore	—'091	—'009	—'113	—'037	+ '003	—'009	+ '008	—'043	+ '036	+ '033	0	+ '029	—'016
	Trichinopoly	—'047	—'021	—'107	—'037	—'038	—'028	—'050	—'046	+ '013	+ '017	+ '011	+ '021	—'026
SOUTH INDIA	Madras	+ '026	+ '016	+ '002	+ '058	+ '022	—'001	+ '029	+ '016	+ '059	+ '065	+ '030	+ '057	+ '032
	Bellary	—'132	+ '010	+ '018	—'001	—'078	—'124	—'104	—'104	—'075	—'041	—'042	—'009	—'057
	Cocanada	—'058	—'101	—'079	+ '007	0	—'041	—'033	—'023	—'027	+ '006	—'063	+ '050	—'030
	Vizagapatam	—'016	—'023	—'025	+ '067	+ '062	+ '039	+ '030	—'011	+ '031	+ '051	+ '041	+ '111	+ '030
HILL STATION BALUCHISTAN	Quetta	—'008	—'037	—'006	—'047	—'014	—'012	+ '002	—'084	—'012	—'015	—'017	—'028	—'023
	Leh	+ '009	+ '005	+ '019	+ '024	—'006	—'008	+ '013	+ '006	—'011	+ '008	+ '012	—'017	+ '004
	Srinagar	+ '009	+ '062	+ '049	+ '065	+ '001	?	+ '047		+ '060	+ '072	+ '004	+ '001	?
	Murree	—'011	—'004	—'002	—'019	—'030	—'022	+ '003	+ '022	+ '008	—'014	—'032	—'002	—'009
HILL STA- TIONS, NORTHERN INDIA.	Kailang	+ '004	+ '002	+ '010	—'011	—'010	?	?	?	+ '004	—'023	—'015	?	?
	Simla (Ridge)	—'029	+ '002	—'039	—'017	—'047	+ '041	—'015	+ '005	—'042	—'009	—'036	+ '003	—'015
	Chakrata	—'022	+ '003	—'042	—'048	—'065	+ '074	?	+ '005	—'037	—'003	—'034	+ '007	?
	Ranikhet	+ '002	—'011	—'035	—'009	—'059	+ '073	+ '001	+ '022	—'021	—'015	—'038	+ '009	—'007
	Katmanda	—'020	+ '010	—'010	+ '055	+ '020	+ '165	?	+ '016	—'028	+ '028	—'013	+ '005	?
	Darjeeling	—'009	?	?	?	—'006	+ '008	+ '003	+ '017	—'019	+ '005	?	+ '032	?

TABLE VIII.—Comparison of the monthly mean vapour pressure data of 1898 with the averages of past years—concl'd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
HILL STATIONS, CENTRAL INDIA.	Mount Abu .	-.030	+.018	-.059	-.038	-.044	+.002	+.018	-.016	-.008	-.081	+.018	+.016	-.017
	Pachmarhi .	-.021	+.121?	-.040	+.160?	+.138?	+.046	+.025	-.008	+.027	-.064	-.013	+.054	+.035
	Chikalda .	-.125	-.032	-.051	-.012	-.032	+.008	+.010	-.016	+.013	-.028	-.026	+.055	-.020
	Wellington .	-.016	+.043	-.093	-.024	-.028	-.019	-.014	-.016	+.036	+.026	-.002	-.005	-.009
HILL STATION, SOUTHERN INDIA.	Muscat .	+.029	-.073	-.047	-.025	?	?	?	?	?	?	?	?	?
	Aden .	?	-.015	-.007	-.098	-.066	-.010	0	-.014	-.013	+.045	-.005	-.033	?
	Perfm .	+.009	-.042	+.023	-.016	+.002	+.067	+.115?	+.035	+.045	+.080	+.037	+.032	+.032
	Zanzibar .	+.032	+.001	+.001	-.012	+.009	-.028	-.013	-.038	-.012	-.028	-.019	-.036	-.012
	Port Victoria (Seychelles).	-.005	-.005	+.024	+.013	+.024	+.006	0	+.017	+.012	-.018	-.060	-.037	-.002
EXTRA INDIAN STATIONS.														

TABLE IX.—Comparison of the monthly mean relative humidity data of 1898 with the averages of past years.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
BURMA COAST AND BAY ISLANDS.	Port Blair .	- 2	- 1	- 2	+ 2	+ 3	- 2	+ 2	- 2	- 1	- 3	- 4	- 6	- 1
	Rangoon .	- 1	- 4	- 1	+ 3	+ 8	- 1	+ 2	+ 3	+ 1	- 4	- 7	- 5	- 1
	Diamond Island	- 3	- 2	- 2	- 5	+ 5	- 3	0	0	- 2	- 6	- 9	- 3	- 3
	Cocos Island .	- 4	0	- 3	- 3	0	- 3	- 1	- 3	- 1	- 2	- 8	- 3	- 3
	Akyab .	+ 5	+ 2	+ 2	+ 1	+ 1	+ 2	+ 3	+ 5	+ 3	+ 3	+ 1	+ 3	+ 3
ASSAM	Silchar .	- 3	- 4	- 17	- 13	- 12	- 5	- 4	- 3	+ 1	- 2	- 7	- 3	- 6
	Sibsagar .	0	+ 4	- 4	+ 4	+ 1	+ 3	+ 4	+ 3	+ 2	+ 2	+ 1	?	?
	Dhubri .	- 3	+ 3	- 6	- 1	- 4	- 2	- 2	- 3	+ 2	+ 1	0	- 1	- 1
	Chittagong .	?	+ 4	0	+ 6	0	0	0	+ 1	0	+ 3	- 4	- 3	?
BENGAL AND ORISSA.	Narayanganj .	+ 1	- 1	- 11	- 3	- 6	0	- 1	0	0	- 1	- 2	- 2	- 2
	Calcutta (Alipore)	- 6	- 6	- 17	0	- 8	- 2	+ 1	0	- 2	- 4	- 3	- 3	- 4
	Saugor Island .	- 3	- 6	- 4	0	- 4	- 3	- 1	0	- 3	- 3	- 4	- 2	- 3
	Burdwan .	- 2	+ 1	- 10	+ 6	- 6	+ 2	+ 1	+ 2	+ 1	0	+ 2	0	0
	Berhampore .	- 5	- 5	- 18	- 8	- 10	0	- 3	- 2	- 1	- 5	- 4	- 7	- 6
	False Point .	- 5	- 9	- 3	0	- 1	- 2	+ 1	+ 3	0	+ 3	+ 2	+ 3	- 1
	Cuttack .	- 6	- 5	- 8	+ 3	- 4	0	+ 4	+ 1	- 1	- 1	- 4	0	- 2
GANGETIC PLAIN AND CHOTA NAGPUR.	Hazaribagh .	- 2	+ 6	- 9	+ 3	- 6	+ 1	- 3	+ 1	- 3	- 5	- 4	- 2	- 2
	Patna .	- 2	+ 5	- 8	0	- 4	- 2	0	+ 3	+ 4	- 1	- 1	- 3	- 1
	Darbhangha .	- 1	+ 6	0	+ 3	- 2	+ 1	- 2	0	+ 5	- 3	0	- 2	0
	Allahabad .	- 15	+ 7	- 8	- 2	+ 5	+ 6	+ 2	+ 4	- 1	- 11	- 7	- 9	- 2
	Lucknow .	- 6	+ 18	- 4	+ 1	- 2	+ 6	?	+ 4	+ 7	- 1	+ 1	+ 2	?
UPPER SUB-HIMALAYAS.	Dehra Dun .	- 13	+ 1	- 7	- 6	- 6	+ 3	0	+ 1	+ 1	- 4	- 5	+ 5	- 3
	Roorkee .	- 8	+ 5	- 5	- 5	- 5	+ 2	0	+ 1	0	- 1	0	+ 3	- 1
	Meerut .	- 15	+ 6	- 8	- 5	- 4	+ 2	- 1	- 6	+ 2	- 7	- 4	- 4	- 4
	Lahore .	- 6	+ 9	- 1	- 4	+ 2	+ 3	+ 12	- 5	0	- 5	- 5	- 2	0
	Ludhiana .	- 16	0	- 13	- 17	- 11	- 8	+ 6	- 10	+ 1	- 6	- 9	- 8	- 8

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TABLE IX.—Comparison of the monthly mean relative humidity data of 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
INDUS VALLEY AND NORTH-WEST RAJ-PUTANA.	Peshawar .	- 7	0	+ 3	-10	+ 1	- 5	+ 5	- 4	+ 8	- 2	- 8	- 8	- 2
	Mooltan .	- 4	+ 7	-11	-16	-12	- 5	- 3	- 8	- 1	-15	- 8	- 5	- 7
	Jacobabad .	- 4	- 2	- 8	- 2	+ 3	+ 3	+ 3	+ 1	?	?	- 4	- 1	?
	Kurrachee .	0	- 9	-14	- 1	0	- 3	- 2	- 4	- 5	- 6	-12	-13	- 6
EAST RAJPUTANA, CENTRAL INDIA AND GUJARAT.	Jeypore .	-13	+ 7	-12	- 8	- 1	- 4	- 6	-14	- 4	-14	-12	0	- 7
	Ajmere .	- 7	+ 5	- 8	- 6	+ 1	- 1	- 1	-10	0	-10	- 5	+ 4	- 3
	Deesa .	- 7	+10	-10	- 5	- 2	0	+ 3	- 6	0	- 9	- 3	+ 8	- 2
	Nowgong .	- 9	+ 3	- 9	- 7	- 7	+ 2	+ 7	+10	+ 7	+ 2	?	?	?
	Agra .	-10	+ 8	- 6	- 3	+12	+ 4	+ 1	0	+ 3	- 6	- 3	+ 1	0
	Belgaum .	-12	+ 7	- 1	+ 8	+ 4	+ 3	+ 2	0	+ 2	0	+ 2	+ 5	+ 2
	Sholapur .	-17	- 3	-10	- 1	- 3	- 7	0	- 5	0	-10	- 6	- 3	- 5
	Poona .	-11	+ 9	- 3	+ 3	- 1	- 3	0	0	+ 2	- 5	+ 1	+ 9	0
	Akola .	-14	- 1	- 6	- 2	- 4	- 2	+ 2	+ 3	- 1	-11	-10	- 7	- 4
	Buldana .	-21	- 4	-12	- 7	- 7	- 6	- 2	- 1	- 1	+ 3	-13	- 6	- 6
DECCAN	Khandwa .	-16	- 5	-10	- 9	- 8	- 3	- 1	- 1	0	- 7	- 8	- 6	- 6
	Hoshangabad .	- 4	0	- 5	- 4	- 5	- 5	+ 1	+ 3	+ 2	- 7	- 4	- 5	- 3
	Nagpur .	-16	+ 4	- 6	- 1	- 2	+ 2	+ 2	+ 3	+ 3	- 8	- 8	- 2	- 2
	Jubbulpore .	- 4	+ 4	- 1	+ 2	- 3	- 2	+ 2	+ 4	+ 3	- 4	- 4	- 2	0
	Saugor .	-19	- 1	- 9	+ 3	?	+10	+ 4	+ 2	0	?	?	- 6	?
	Sutna .	-12	+ 3	- 5	- 3	- 4	+ 9	+ 7	+ 8	+ 2	- 5	- 2	0	0
	Raipur .	-12	0	-10	- 7	- 8	- 4	+ 1	+ 2	- 1	- 6	- 8	- 3	- 5
	Hyderabad (Dec- can).	-12	- 2	-10	?	- 5	- 7	+ 6	- 6	- 2	- 6	- 3	0	?
	Bombay .	- 6	- 3	- 6	- 2	- 4	- 1	- 2	- 5	- 2	- 7	- 4	- 4	- 4
	Ratnagiri .	-16	0	- 3	- 1	- 2	0	+ 3	- 1	+ 3	- 4	- 2	+ 6	- 1
WEST COAST	Karwar .	-10	- 1	0	- 2	- 4	- 1	- 3	- 4	- 1	- 3	0	+ 3	- 2
	Cochin .	- 6	- 2	- 6	- 2	- 2	- 2	- 2	- 4	- 1	+ 1	- 2	- 7	- 3
	Salem .	0	+ 4	- 2	?	+ 3	- 2	- 6	- 6	+ 5	+ 2	+ 5	+ 3	?
	Mercara .	- 9	- 1	-10	- 2	0	+ 2	0	- 1	+ 3	+ 2	0	- 4	- 2
SOUTH INDIA	Chitaldroog .	- 2	+ 3	- 8	+ 1	0	0	+ 3	- 5	+ 7	+ 5	+ 3	+ 4	+ 1
	Bangalore .	- 5	+ 1	-11	0	- 3	0	- 3	- 7	+ 4	0	+ 5	+ 4	- 1
	Hassan .	- 8	- 2	-13	- 5	- 1	+ 2	+ 1	- 3	+ 6	+ 2	0	0	- 2
	Mysore .	-11	- 1	-10	- 5	- 2	- 2	- 1	- 5	+ 6	+ 3	+ 6	+ 4	- 2
	Trichinopoly .	- 7	- 5	- 6	- 4	- 4	- 6	- 7	- 7	+ 2	+ 2	+ 3	+ 3	- 3
	Madras .	+ 6	+ 3	+ 4	+ 5	0	- 3	0	- 1	+ 7	+ 7	+ 4	+ 4	+ 3
	Bellary .	-12	+ 4	+ 3	+ 3	- 4	-11	-10	-11	- 6	- 4	- 5	- 2	- 5
	Cocanada .	- 5	- 8	- 6	- 1	+ 1	- 4	0	- 3	- 2	- 2	- 6	+ 1	- 3
	Vizagapatam .	+ 2	+ 5	0	+ 7	+ 5	+ 6	+ 4	- 2	+ 4	+ 4	+ 8	+11	+ 5

TABLE IX.—Comparison of the monthly mean relative humidity data of 1898 with the averages of past years—concl'd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
HILL STATION, BALUCHISTAN.	Quetta . .	—15	—18	0	—12	—2	—3	—1	—10	—4	—4	—5	—3	—6
	Leh . .	—6	—6	—1	+3	+2	—5	+5	—2	—2	+4	+4	—7	—1
	Srinagar . .	0	+7	+2	+5	+8	?	+7	?	+4	+3	—10	—1	?
	Murree . .	—14	—1	—2	—14	—3	—9	+4	—2	+6	—6	—11	+4	—4
HILL STA- TIONS, NORTHERN INDIA.	Kailang . .	—10	+3	—6	—16	0	?	?	?	—1	—11	—6	?	?
	Simla (Ridge) .	—17	+9	—12	—7	—6	+5	+1	+1	—1	—1	—8	+10	—2
	Chakrata . .	—17	+8	—18	—13	—10	+12	?	+2	—2	—3	—8	+9	?
	Ranikhet . .	—7	+3	—14	—8	—9	+10	+2	+2	—3	—4	—7	+9	—2
	Katmandu . .	—6	+2	—4	0	+1	+17	?	0	+2	+2	—2	+2	?
	Darjeeling . .	—7	?	?	?	—2	—1	0	0	—1	—1	?	+12	?
HILL STA- TIONS, CENTRAL INDIA.	Mount Abu . .	—13	+6	—11	—7	—3	0	+2	—2	—2	—15	—1	+4	—4
	Pachmarhi . .	—3	+17	0	+8	+8	+4	+5	+4	+3	—9	—6	+3	+3
	Chikalda . .	—22	—1	—8	—3	—4	0	—9	+2	—2	—8	—8	+2	—5
HILL STATION, SOUTH INDIA.	Wellington . .	—6	+6	—17	—5	—5	—6	—4	—4	+6	+3	—2	—5	—3
	Muscat . .	0	—11	—2	—7	?	?	?	?	?	?	?	?	?
EXTRA INDIA STATIONS.	Aden . .	?	—2	0	—6	—7	+3	—4	—4	—2	+4	0	—3	?
	Perim . .	—2	—4	+3	+1	+1	+7	+9	+2	+4	+6	+4	+5	+3
	Zanzibar . .	0	—2	+1	—8	—4	—4	—5	—4	—2	—3	—5	—6	—4
	Port Victoria (Seychelles).	+2	0	—1	—4	+1	0	+1	—3	+4	0	—7	—4	—1

TABLE X.—Geographical summary of the aqueous vapour pressure data of Table II in the monthly weather reviews of 1898.

METEOROLOGICAL PROVINCE.	Number of stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
North-West Himalaya	5—7	—'005	+ '008	—'006	—'002	—'031	+ '032	+ '009	+ '012	—'006	+ '002	—'020	0	—'001
Sikkim Himalaya and Nepal.	1—2	—'015	+ '010	—'010	+ '055	+ '007	+ '087	+ '003	+ '017	—'024	+ '017	—'013	'019	+ '013
Punjab Plains . .	4	—'013	+ '025	—'038	—'070	—'080	+ '013	+ '021	—'019	+ '004	—'059	—'056	—'034	—'026
Gangetic Plain . .	7—8	—'031	+ '038	—'040	+ '017	+ '003	+ '058	+ '005	+ '009	+ '003	—'028	—'012	+ '009	+ '003
Western Rajputana .	3—4	—'008	+ '003	—'091	+ '005	+ '002	+ '040	+ '033	—'011	—'017	—'068	—'015	—'007	—'011
Eastern Rajputana and Central India.	3—5	—'052	+ '022	—'055	+ '009	—'024	+ '067	+ '029	—'014	+ '031	—'049	—'016	+ '020	—'003
Nerbudda Valley . .	3	—'080	—'007	—'037	+ '004	—'046	—'018	+ '009	—'027	+ '027	—'058	—'008	+ '029	—'018
Chota Nagpur . .	1	—'013	+ '031	—'064	+ '068	—'035	+ '040	—'010	—'009	—'016	—'037	—'019	+ '014	—'004
Lower Bengal . .	5	—'020	—'012	—'121	+ '012	—'045	—'012	—'008	—'001	—'013	—'028	—'010	+ '001	—'021
Assam and Cachar .	2—3	—'010	+ '008	—'062	+ '021	—'015	+ '003	+ '008	+ '008	—'006	+ '002	—'028	—'005	—'006
Orissa . .	2	—'075	—'072	—'084	+ '040	+ '008	+ '007	+ '016	+ '002	+ '011	+ '012	—'007	+ '070	—'006

TABLE X.—Geographical summary of the aqueous vapour pressure data of Table II in the monthly weather reviews of 1898—concl'd.

METEOROLOGICAL PROVINCE.	Number of stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		"	"	"	"	"	"	"	"	"	"	"	"	"
Central Provinces (South) and Berar.	6	—'108	+ '001	—'060	+ '007	—'019	—'005	+ '011	—'017	+ '009	—'080	—'041	+ '035	—'022
Konkan	3	—'081	—'032	—'012	+ '011	—'009	+ '002	—'010	—'011	—'002	+ '010	0	+ '044	—'008
Malabar Coast	1	—'045	+ '008	—'028	+ '017	+ '009	+ '010	—'001	+ '013	—'004	+ '018	—'025	—'026	—'005
Deccan, Hyderabad and Mysore.	9-10	—'093	—'015	—'075	+ '002	—'012	—'021	0	—'026	+ '011	+ '002	—'011	+ '023	—'018
East Coast and Carnatic.	4-5	—'021	—'017	—'057	+ '024	+ '014	—'005	—'008	—'018	+ '019	+ '032	+ '011	+ '057	+ '003
Arakan and Pegu	3-4	+ '013	+ '023	—'009	+ '040	+ '031	+ '029	+ '005	+ '014	+ '009	+ '024	—'042	—'025	+ '008
Bay Islands	2	—'027	0	—'045	—'007	—'007	+ '002	+ '001	+ '008	+ '006	+ '015	—'052	—'018	—'010
Extra-Tropical India	40-44	—'027	+ '010	—'053	+ '006	—'024	+ '031	+ '012	—'002	+ '001	—'027	—'019	+ '006	—'007
Tropical India	30-32	—'064	—'006	—'052	+ '011	—'003	—'005	0	—'013	+ '010	—'002	—'019	+ '022	—'010
Whole India	72-75	—'043	+ '003	—'053	+ '008	—'015	+ '015	+ '007	—'007	+ '005	—'016	—'019	+ '013	—'009

TABLE XI.—Geographical summary of the humidity data of Table II in the monthly weather reviews of 1898.

METEOROLOGICAL PROVINCE.	Number of stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
North-West Himalaya	5-7	—10	+3	—7	—7	—3	+3	+4	0	0	—3	—7	+4	—2
Sikkim Himalaya and Nepal.	1-2	—7	+2	—4	0	—1	+6	0	0	+1	+1	—2	+7	0
Punjab Plains	4	—8	+4	—6	—12	—5	—4	+5	—7	+2	—7	—8	—6	—4
Gangetic Plain	7-8	—9	+7	—6	—2	—1	+3	0	+1	+3	—4	—2	—1	—1
Western Rajputana	3-4	—6	+1	—11	—4	—1	0	+2	—3	—2	—10	—5	—1	—3
Eastern Rajputana and Central India.	3-5	—12	+3	—9	—4	—3	+3	+2	—1	+1	—7	—6	—1	—3
Nerbuda Valley	3	—8	0	—5	—4	—5	—3	+1	+2	+2	—6	—5	—4	—3
Chota Nagpur	1	—2	+6	—9	+3	—6	+1	—3	+1	—3	—5	—4	—2	—2
Lower Bengal	5	—3	—3	—12	—1	—7	—1	—1	0	—1	—3	—2	—3	—3
Assam and Cachar	2-3	—2	+1	—9	—3	—5	—1	—1	—1	+2	0	—2	—2	—2
Orissa	2	—6	—7	—6	+2	—3	—1	+3	+2	—1	+1	—2	+2	—1
Central Provinces (South) and Berar.	6	—15	+3	—7	—2	—3	—1	0	+2	0	—7	—9	—2	—3
Konkan	3	—11	—1	—3	—2	—3	—1	—1	—3	0	—5	—2	+2	—3
Malabar Coast	1	—6	—2	—6	—2	—2	—2	—2	—4	—1	+1	—2	—7	—3
Deccan, Hyderabad and Mysore.	9-10	—10	+2	—7	0	—2	—2	0	—4	+2	—1	0	+2	—2
East Coast and Carnatic.	4-5	—1	0	—2	+2	+1	—2	—2	—4	+3	+3	+3	+4	0
Arakan and Pegu	3-4	0	0	0	+1	+4	—1	+1	+2	+1	—1	—5	—2	0
Bay Islands	2	—3	—1	—2	0	+2	—3	+1	—3	—1	—3	—6	—5	—2
Extra-Tropical India	40-44	—7	+2	—8	—4	—3	+1	+1	—1	+1	—4	—4	—1	—2
Tropical India	30-32	—8	+1	—5	0	—1	—2	0	—2	+1	—2	—2	0	—2
Whole India	72-75	—8	+2	—7	—2	—2	0	+1	—1	+1	—3	—3	0	—2

TABLE XII.—Variations of the mean monthly aqueous vapour pressure from the normal in ten meteorological provinces of India in 1898.

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
Burma Coast and Bay Islands	"	"	"	"	"	"	"	"	"	"	"	"	"
Assam	-.003	+.007	-.021	+.016	+.014	+.013	+.017	+.014	+.016	+.022	-.043	-.024	+.002
Bengal and Orissa	-.009	+.008	-.062	+.021	-.015	+.003	+.008	+.008	-.006	+.002	-.028	-.005	-.006
Gangetic Plain and Chota Nagpur.	-.035	-.018	-.097	+.025	-.021	+.001	-.002	+.001.	-.008	-.012	-.015	+.014	-.014
Upper Sub-Himalayas	-.023	+.050	-.042	+.055	-.002	+.036	+.008	+.007	-.002	-.029	-.002	+.008	+.005
Indus Valley and North-West Rajputana.	-.038	+.016	-.042	-.039	-.066	+.052	+.006	-.011	-.009	-.041	-.043	-.011	-.019
East Rajputana, Central India and Gujarat.	+.015	+.003	-.066	-.006	-.020	+.035	+.021	-.003	-.003	-.051	-.052	-.040	-.014
Deccan	-.038	+.033	-.072	-.031	+.016	+.045	+.032	-.015	+.029	-.051	-.007	+.029	-.003
West Coast	-.107	-.015	-.055	+.008	-.038	+.001	+.012	-.018	+.012	-.058	-.027	+.031	-.021
South India	-.072	-.022	-.016	+.013	-.005	+.004	+.008	-.005	-.002	+.012	-.006	+.026	-.005
	-.048	-.010	-.069	+.004	-.001	-.013	-.007	-.025	+.018	+.026	-.004	+.031	-.008

TABLE XIII.—Variations of the mean monthly relative humidity from the normal in ten meteorological provinces of India in 1898.

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
Burma Coast and Bay Islands.	- 1	- 1	- 1	0	+ 4	- 1	+ 2	+ 2	- 1	- 3	- 5	- 3	- 1
Assam	- 2	+ 1	- 9	- 3	- 5	- 1	- 1	- 1	+ 2	0	- 2	- 2	- 2
Bengal and Orissa	- 4	- 3	- 9	+ 1	- 5	- 1	0	+ 1	- 1	0	- 2	- 2	- 2
Gangetic Plain and Chota Nagpur.	- 5	+ 8	- 6	+ 1	- 2	+ 2	- 1	+ 2	+ 2	- 4	- 2	- 3	- 1
Upper Sub-Himalayas	-12	+ 4	- 7	- 7	- 5	0	+ 3	- 4	+ 1	- 4	- 5	- 1	- 3
Indus Valley and North-West Rajputana.	- 4	- 1	- 8	- 7	- 2	- 2	+ 1	- 4	+ 1	- 8	- 8	- 7	- 4
East Rajputana, Central India and Gujarat.	- 9	+ 7	- 9	- 6	+ 1	0	+ 1	- 4	+ 1	- 7	- 6	+ 3	- 2
Deccan	-13	+ 1	- 7	- 2	- 4	- 1	+ 2	+ 1	+ 1	- 6	- 5	- 2	- 3
West Coast	-10	- 2	- 4	- 2	- 3	- 1	- 1	- 4	0	- 3	- 2	- 1	- 3
South India	- 5	0	- 5	0	- 1	- 2	- 2	- 5	+ 3	+ 2	+ 2	+ 3	- 1

I.—The cold weather period.—Weather was less disturbed by storms than usual during the greater part of this period. The air was abnormally dry over nearly the whole of India in January. It was damper than usual in Rajputana, the Gangetic Plain, Chota Nagpur and the South and Central Punjab in February, due chiefly to the advance of four cold weather storms two of which were of moderate intensity across India during the month. The following gives the more important features:—

- (1) The air was drier than usual throughout the period in South Bengal, Orissa and Lower Burma. The following gives comparative data:—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN			VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.	January 1898.	February 1898.	Period January and February 1898.
South Bengal	"	"	"			
Orissa	-.041	-.045	-.043	-5	-6	-5
Lower Burma	-.075	-.072	-.073	-6	-7	-6
	-.001	+.002	0	-2	-3	-2

(2) The air was considerably drier than usual in the Punjab, Rajputana, the North-Western Provinces, Bihar and Chota Nagpur in the month of January but was damper to a moderate extent in February. The variations on the mean of the period were hence slight. The following gives data :—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN			VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.	January 1898.	February 1898.	Period January and February 1898.
	"	"	"			
Punjab	—'013	+ '025	+ '006	—8	+4	—2
Rajputana	—'043	+ '030	—'006	—9	+7	—1
North-Western Provinces and Oudh	—'041	+ '038	—'001	—11	+8	—1
Bihar	—'002	+ '040	—'019	—2	+6	+2
Chota Nagpur	—'013	+ '031	—'009	—2	+6	+2

(3) The variations at the hill stations in North-Western India were similar to those in the adjacent plains. The following gives comparative data for seven stations :—

STATION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN			VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.	January 1898.	February 1898.	Period January and February 1898.
	"	"	"			
Leh	+ '009	+ '005	+ '007	—6	—6	—6
Kailang	+ '004	+ '002	+ '003	—10	+3	—3
Murree	—'011	—'004	—'007	—14	—1	—7
Srinagar	+ '009	+ '062	+ '035	0	+7	+3
Simla	—'029	+ '002	—'013	—17	+9	—4
Chakrata	—'022	+ '003	—'009	—17	+8	—4
Ranikhet	+ '002	—'011	—'004	—7	+3	—2

(4) The air was excessively dry in Baluchistan and contained much less aqueous vapour than usual in Persia and Arabia and at Baghdad, as is shown by the following comparative data :—

STATION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN			VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.	January 1898.	February 1898.	Period January and February 1898.
	"	"	"			
Quetta	—'008	—'037	—'022	—15	—18	—16
Muscat	+ '029	—'073	—'022	0	—11	—5
Aden	?	—'015	?	?	—2	?
Bushire	—'041	—'036	—'039	0	—5	—3
Baghdad	—'045	—'035	—'042	+ 4?	—5	0?

(5) The air was remarkably dry, more especially in January in Berar, the Central Provinces and the Central Deccan. The following gives data :—

DIVISION OR PROVINCE.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN			VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.	January 1898.	February 1898.	Period January and February 1898.
	"	"	"			
Berar	—'136	—'038	—'087	—18	—3	—10
Central Provinces	—'096	—'005	—'050	—12	0	—6
Central Deccan	—'131	—'052	—'091	—15	—3	—9

The following gives January data for five stations in this area of excessive dryness of the air :—

STATION.	ABSOLUTE HUMIDITY.			RELATIVE HUMIDITY.		
	Actual, January 1898.	Normal, January.	Variation of actual from normal, January 1898.	Actual, January 1898.	Normal, January.	Variation of actual from normal, January 1898.
	"	"	"	%	%	
Chikalda	'184	'309	—'125	30	52	—22
Buldana	'161	'310	—'149	23	44	—21
Sholapur	'194	'350	—'156	27	44	—17
Nagpur	'228	'359	—'131	36	52	—16
Khandwa	'154	'325	—'131	33	49	—16

(6) Humidity was on the mean of the period slightly below the normal in Southern India and the South Deccan

and normal in Burma and the Madras Coast. The following gives comparative data for these four provinces or areas :—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN			VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN		
	January 1898.	Febru- ary 1898.	Period January and Febru- ary 1898.	January 1898.	Febru- ary 1898.	Period January and Febru- ary 1898.
Burma	+ '013	+ '012	+ '012	0	- 1	0
South Deccan	- '132	+ '010	- '061	-12	+ 4	- 4
Madras Coast	- '016	- '036	- '026	+ 1	0	0
South India	- '029	+ '012	- '008	- 4	- 1	- 2

II.—The hot weather period.—The hot weather season of 1898 was even drier than usual over nearly the whole of India. Five depressions affected Northern India in March, but gave practically no rain in the plains of India. The advance of each depression was followed by an influx of very dry air from the north-west. The quantity of vapour present in the air was very largely below the normal and very low humidities were recorded during the month. The driest periods during the month were from the 1st to the 8th following the advance of the first depression of the month and the 20th to the 23rd subsequent to the fourth depression of the month.

The following gives the more noteworthy humidities during the first period :—

STATION.	Date.	Hour.	Relative humidity.
Jacobabad	3rd March .	10 A.M.	% 0
Buldana	" " .	"	0
Buldana	" " .	4 P.M.	0
Buldana	4th " .	10 A.M.	0
Buldana	" " .	4 P.M.	0
Deesa	2nd " .	"	1
Poona	4th " .	10 A.M.	1
Deesa	3rd " .	4 P.M.	3
Poona	" " .	"	4
Mount Abu	5th " .	"	4
Deesa	" " .	10 A.M.	4
Deesa	4th " .	4 P.M.	5
Buldana	5th " .	10 A.M.	5
Saugor	6th " .	4 P.M.	5
Jacobabad	1st " .	"	6
Sholapur	2nd " .	"	6
Cuttack	4th " .	"	6
Jacobabad	2nd " .	"	7
Kurrachee	1st " .	"	8

STATION.	Date.	Hour.	Relative humidity.
Mount Abu	2nd March .	10 A.M.	% 8
Kurrachee	" " .	"	8
Khandwa	4th " .	4 P.M.	8
Akola	" " .	"	9
Berhampore	8th " .	"	9
Calcutta	" " .	"	11

The following gives the lowest humidities recorded during the second dry period of the month :—

STATION.	Date.	Hour.	Relative humidity.
Deesa	20th March .	4 P.M.	% 4
Poona	" " .	"	6
Mount Abu	21st " .	"	7
Sutna	" " .	"	6
Akola	" " .	"	8
Poona	" " .	"	6
Mount Abu	22nd " .	10 A.M.	4
Sutna	" " .	4 P.M.	7
Khandwa	" " .	"	4
Nagpur	" " .	10 A.M.	8
Akola	" " .	"	8
Poona	" " .	4 P.M.	6
Poona	23rd " .	"	4
Buldana	" " .	10 A.M.	5
"	" " .	4 P.M.	4

A depression which formed in Sind on the 4th and 5th of April advanced eastwards across Rajputana, Central India and Bihar. It was followed by a cool dry wave. Very low humidities were recorded during the period from the 7th to the 12th. The most noteworthy are given below :—

STATION.	Date.	Hour.	Relative humidity.
Sutna	8th April .	4 P.M.	% 3
Deesa	" " .	"	4
Berhampore	" " .	"	7
Darbhanga	" " .	"	8
Burdwan	" " .	"	8
Khandwa	9th " .	"	5
Khandwa	10th " .	"	4
Roorkee	11th " .	"	3
Raipur	" " .	"	0
Sutna	" " .	"	4
Saugor	" " .	10 A.M.	6
Raipur	12th " .	4 P.M.	5

Very hot dry weather prevailed in the last week of the month of April (*i.e.*, from the 25th to the 30th) and very low humidities were registered during this period. The most noteworthy were:—

STATION.	Date.	Relative humidity at 4 P.M.
		%
Roorkee	28th April.	2
Meerut	" "	4
Hazaribagh	29th "	5
Akola	30th "	3
Sutna	" "	5
Hazaribagh	" "	5

Very hot dry weather prevailed over the whole of the interior of Northern and Central India and in the Deccan during the first ten days of the month of May. The highest maximum temperatures of the month were recorded during this period in Upper India. Very low humidities were registered, the most noteworthy being as follows:—

STATION.	Date.	Relative humidity at 4 P.M.
		%
Deesa	3rd May	7
Roorkee	" "	7
Khandwa	4th "	6
Akola	5th "	5
Meerut	" "	8
Raipur	6th "	4
Akola	" "	4
Jubbulpore	" "	6
Jeypore	" "	6
Nowgong	" "	6
Raipur	7th "	2
Sutna	" "	4
Akola	" "	5
Nowgong	" "	6
Jubbulpore	" "	6

Weather was disturbed both in Upper India and in Bengal during the next fortnight. Dry hot westerly winds prevailed in the Gangetic Plain during the last week of the month of May.

The air was also very dry in Upper India during the first ten days of June immediately antecedent to the advance of the monsoon across the Bombay Coast. The

humidities recorded during these two periods were not nearly so low as were registered in the dry periods in March and April. The lowest was 9 recorded at several stations in Central India and the Central Provinces on the 3rd and 4th of June.

The air was abnormally dry during the whole period in India and hence the relative humidity was below the normal almost without exception. The following gives the chief abnormal features of the humidity conditions of the period:—

- (1) The air was unusually dry in Cachar and the interior of Bengal. The following gives data for five stations in this area:—

STATION.	VARIATION OF ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF RELATIVE HUMIDITY FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.	March 1898.	April 1898.	May 1898.	Period March to May 1898.
	"	"	"	"				
Silchar	-'124	-'024	-'041	-'063	-17	-13	-12	-14
Narayanganj	-'112	+ '020	-'041	-'044	-11	-3	-6	-7
Berhampore	-'155	-'020	-'080	-'085	-18	-8	-10	-12
Burdwan	-'084	+ '058	-'033	-'020	-10	+ 6	-6	-3
Calcutta	-'178	+ '010	-'058	-'075	-17	0	-8	-8

- (2) The air was abnormally dry over the greater part of Upper India. The following gives comparative data for stations at which this feature was most strongly exhibited in the plains of Upper India:—

STATION.	VARIATION OF ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF RELATIVE HUMIDITY FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.	March 1898.	April 1898.	May 1898.	Period March to May 1898.
	"	"	"	"				
Ludhiana	-'069	-'118	-'109	-'099	-13	-17	-11	-14
Mooltan	-'084	-'125	-'159	-'123	-11	-16	-12	-13
Roorkee	-'040	-'028	-'067	-'045	-5	-5	-5	-5
Jeypore	-'084	-'045	-'017	-'049	-12	-8	-1	-7

The excessive dryness of the air was as marked at the hill stations in Upper India as in the adjacent plains, as will be seen from the following data :—

STATION.	VARIATION OF ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF RELATIVE HUMIDITY FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.	March 1898.	April 1898.	May 1898.	Period March to May 1898.
	"	"	"	"				
Kailang . . .	+ '010	- '011	- '010	- '004	- 6	- 16	0	- 7
Simla . . .	- '039	- '017	- '047	- '034	- 12	- 7	- 6	- 8
Chakrata . . .	- '042	- '048	- '065	- '052	- 18	- 13	- 10	- 14
Ranikhet . . .	- '035	- '009	- '059	- '034	- 24	- 8	- 9	- 10
Mount Abu . . .	- '059	- '038	- '044	- '047	- 11	- 7	- 3	- 7

- (3) The air was slightly damper in Burma in April and May due to an earlier and stronger determination of humid winds into that province than usual antecedent to the rains proper. On the mean of the period the humidity was practically normal. The following gives comparative data for four stations :—

STATION.	VARIATION OF ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF RELATIVE HUMIDITY FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.	March 1898.	April 1898.	May 1898.	Period March to May 1898.
	"	"	"	"				
Port Blair . . .	- '051	- '010	- '021	- '027	- 2	+ 2	+ 2	+ 1
Rangoon . . .	- '011	+ '065	+ '023	+ '026	- 1	+ 3	+ 8	+ 3
Diamond Island . . .	- '026	- '021	- '012	- '020	- 2	- 5	+ 5	- 1
Akyab . . .	+ '006	+ '049	+ '067	+ '041	+ 2	+ 1	+ 1	+ 1

- (4) Humidity was lower than usual over nearly the whole of the remainder of India by small to moderate amounts, chiefly due to increased temperature. The following gives comparative data :—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.	March 1898.	April 1898.	May 1898.	Period March to May 1898.
North-Western-Provinces and Oudh	- '045	+ '001	+ '021	- '008	- 6	- 3	0	- 3
Central India . . .	- '053	- '010	- '048	- '037	- 7	- 5	- 6	- 6
Central Provinces . . .	- '047	+ '013	- '050	- '028	- 7	- 3	- 5	- 5
Berar . . .	- '066	- '024	- '055	- '048	- 9	- 5	- 6	- 7
Deccan . . .	- '050	+ '018	- '027	- '020	- 4	+ 3	- 2	- 1
Madras Coast . . .	- '034	+ '044	+ '028	+ '013	- 1	+ 4	+ 2	+ 2
Bombay Coast . . .	- '016	+ '013	- '005	- '003	- 4	- 2	- 3	- 3
Mysore . . .	- '104	- '014	- '001	- '040	- 11	- 2	- 4	- 6
South India . . .	- '092	- '037	- '007	- '045	- 4	- 4	- 1	- 3

The driest periods during the hot weather season in Northern and Central India were the 1st to the 8th March, the 20th to the 23rd March, the 7th to the 12th April, the 25th to the 30th April, the 3rd to the 7th May and the 21st to the 23rd of May. The lowest humidities recorded during the season were as follows :—

STATION.	DATE AND MONTH.	HOUR.	Lowest relative humidity.
			%
Jacobabad	3rd March 1898	10 A.M.	0
Buldana	" " "	"	0
Buldana	" " "	4 P.M.	0
Buldana	4th " "	10 A.M.	0
Buldana	" " "	4 P.M.	0
Deesa	2nd " "	"	1
Poona	4th " "	10 A.M.	1
Deesa	3rd " "	4 P.M.	3
Raipur	11th April "	"	0
Roorkee	28th " "	"	2
Sutna	8th " "	"	3
Roorkee	11th " "	"	3
Akola	30th " "	"	3
Raipur	7th May "	"	2

Humidities as low as 10 per cent are of frequent occurrence in the hot weather and as low as 5 per cent. of occasional occurrence. At the driest stations, more especially Deesa, Pachmarhi, Khandwa, Nowgong, Pachpadra, Bickaneer and Jacobabad humidities of 2 and 3 per cent. are usually registered on one or two occasions in each year. The data show that there were six cases of zero humidity and two of humidity one in the hot weather of 1898. The humidity percentages are, however, calculated

by August's modification of Regnault's formula, and it is almost certain that it does not give accurate results for very low humidities.

III.—The south-west monsoon period.—The Bombay monsoon current was weak in June. It was slightly later in being established on the Bombay coast than usual, but advanced rapidly into Upper India for a brief period and again withdrew until nearly the end of the month. The monsoon currents were strong and steady in July and September and gave slightly higher humidity than the normal over the whole of India. The Bombay current was in August determined more largely than usual across the north of the Peninsula to North-Eastern India where the air was hence slightly damper than usual. The air was hence considerably drier in June and August in Upper India and the Deccan. The conditions in these areas during these two months are best shown by comparative data for representative stations:—

(1) For the dry area in Upper India—

STATION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN					VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN				
	June 1898.	July 1898.	Aug. 1898.	Sept. 1898.	Period June to September 1898.	June 1898.	July 1898.	Aug. 1898.	Sept. 1898.	Period June to September 1898.
Ludhiana	-.009	+.024	-.048	-.014	-.012	-.8	+6	-10	+1	-3
Jeyapore	+.017	-.035	-.079	0	-.024	-4	-6	-14	-4	-7
Ajmere	+.043	+.056	-.036	+.046	+.027	-1	-1	-10	0	-3
Deesa	+.007	+.040	-.033	+.004	+.004	0	+3	-6	0	-1
Mooltan	+.009	-.004	-.056	-.052	-.026	-5	-3	-8	-1	-4
Feshawar	-.022	+.015	+.041	+.092	+.031	-5	+5	-4	+8	+1

The decreased humidity during the two months of June and August was hence most strongly marked in the South-East Punjab and Rajputana.

(2) The Deccan and South India dry area:—

STATION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN					VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN				
	June 1898.	July 1898.	Aug. 1898.	Sept. 1898.	Period June to September 1898.	June 1898.	July 1898.	Aug. 1898.	Sept. 1898.	Period June to September 1898.
Buldana	-.050	-.005	-.026	-.006	-.022	-6	-2	-1	-1	-2
Sholapur	-.043	-.009	-.041	-.006	-.025	-7	0	-5	0	-3
Hyderabad (Deccan.)	-.040	+.032	-.024	-.001	-.008	-7	+6	-6	-2	-2
Bellary	-.124	-.104	-.104	-.075	-.102	-11	-10	-11	-6	-9
Bangalore.	-.003	-.006	-.027	+.035	0	0	-3	-7	+4	-1
Trichinopoly	-.028	-.050	-.046	+.013	-.028	-6	-7	-7	+2	-4

The following is a brief statement of the chief features of the mean humidity conditions of the whole period:—

(1) Humidity was on the mean of the period in slight to moderate defect in Baluchistan and Upper India, chiefly due to increased temperature. The following gives data:—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN					VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Baluchistan	-.012	+.002	-.084	-.012	-.026	-3	-1	-10	-4	-4
Punjab	+.013	+.022	-.019	+.004	+.005	-4	+5	-7	+2	-1
Sind	+.076	+.036	+.002	-.048	+.016	0	+1	-2	-5	-1
Rajputana	+.022	+.020	-.049	+.017	+.002	-2	-1	-10	-1	-3

(2) The humidity was on the mean of the period normal or in defect by small amounts over the interior of the Peninsula, as is shown below:—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN					VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Barar	-.034	+.010	-.014	"	-.009	-4	0	+1	-1	-1
Bombay Deccan.	-.020	+.002	-.017	+.007	-.007	-2	+1	-2	+1	0
Mysore	+.001	+.015	-.021	+.039	+.008	0	0	-5	+6	0
Madras Coast	-.001	+.009	-.006	+.021	+.006	0	+1	-2	+3	0
Madras Deccan.	-.124	-.104	-.104	-.075	-.102	-11	-10	-11	-6	-9
South India	-.012	-.033	-.037	+.017	-.016	-4	-7	-7	+4	-3

(3) Over the remainder of India humidity was practically normal, as is shown below:—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN					VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Burma	+.021	+.008	+.015	+.017	+.015	-1	+2	+3	+1	+1
Assam	+.003	+.008	+.008	-.006	+.003	-1	-1	-1	+2	0
Bengal	-.001	-.007	+.001	-.014	-.005	-1	-1	0	-1	-1
Bihar	+.001	+.012	+.014	-.015	+.003	-1	-1	+2	+5	+1
Chota Nagpur	+.040	-.010	-.007	-.016	+.002	+1	-3	+1	-3	-1
North-Western Provinces and Oudh.	+.077	+.002	+.008	+.009	+.024	+4	0	+1	+2	+2
Central Provinces.	+.006	+.005	-.026	+.017	0	-1	+2	+2	+1	+1

The increased humidity in these districts accompanied a slight excess of aqueous vapour.

IV.—The retreating south-west monsoon period.—The monsoon currents withdrew from the Punjab in the third week of September and from North-Eastern India in the third week of October. The greater part of the Peninsula, more especially the Madras Presidency, received favourable rain in September and the first and last weeks of October. The rains ceased unusually early in Tenasserim in the fourth week of October. The rainfall of the retreating south-west monsoon was chiefly determined to the southern half of the Peninsula in November and December. The mean humidity conditions of November and December were similar in general character to those of the second half of October, but were more strongly marked.

(1) The chief feature of the period was the abnormal dryness of the air over the whole of Northern and Central India and the northern half of the Peninsula. The following gives comparative data :—

AREA.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period November and December 1898.	October 1898.	November 1898.	December 1898.	Period November and December 1898.
Burma . . .	+ '024	— '035	— '021	— '028	— 2	— 5	— 2	— 3
Bengal . . .	— '020	— '018	— '005	— '011	— 2	— 3	— 3	— 3
Bihar . . .	— '011	+ '005	+ '005	+ '005	— 2	— 1	— 3	— 2
Chota Nagpur . .	— '037	— '019	+ '014	— '002	— 5	— 4	— 2	— 3
North-Western Provinces and Oudh.	— '034	— '018	+ '011	— '003	— 5	— 3	0	— 1
Punjab . . .	— '059	— '056	— '034	— '045	— 7	— 8	— 6	— 7
Sind . . .	— '037	— '049	— '049	— '049	— 6	— 8	— 7	— 7
Rajputana . . .	— '089	— '012	+ '030	+ '009	— 11	— 7	+ 4	— 1
Central India . .	— '005	+ '009	+ '039	+ '024	— 2	— 2	0	— 1
Berar . . .	— '109	— '060	+ '022	— '019	— 4	— 12	— 7	— 9
Central Provinces .	— '065	— '023	+ '025	+ '001	— 6	— 6	— 4	— 5
Bombay Deccan . .	— '028	— '025	+ '041	+ '008	— 5	— 1	+ 4	+ 1
Konkan . . .	+ '040	0	+ '044	+ '022	— 5	— 2	+ 2	0

The deficiency was throughout most marked in the Punjab, Sind, Berar and the Central Provinces. Comparative data are given below for the stations at which the deficiency was greatest :—

STATION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period November and December 1898.	October 1898.	November 1898.	December 1898.	Period November and December 1898.
Khandwa . . .	— '058	— '017	+ '031	+ '007	— 7	— 8	— 6	— 7
Akola . . .	— '099	— '043	+ '038	— '002	— 11	— 10	— 7	— 8
Buldana . . .	— '118	— '077	+ '006	— '035	+ 3	— 13	— 6	— 9
Sholapur . . .	— '068	— '049	+ '017	— '016	— 10	— 6	— 3	— 4
Kurrachee . . .	— '037	— '067	— '091	— '079	— 6	— 12	— 13	— 12
Mooltan . . .	— '127	— '062	— '033	— '047	— 15	— 8	— 5	— 6
Jeypore . . .	— '118	— '058	0	— '029	— 14	— 12	0	— 6
Ludhiana . . .	— '061	— '062	— '043	— '052	— 6	— 9	— 8	— 8

(2) The air was slightly damper throughout the period in the southern half of the Peninsula (to the south of Lat. 14° N.) and in North Madras :—

DIVISION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period November and December 1898.	October 1898.	November 1898.	December 1898.	Period November and December 1898.
Madras Coast . .	+ '041	+ '003	+ '073	+ '028	+ 3	+ 2	+ 5	+ 3
Mysore . . .	+ '037	+ '011	+ '022	+ '016	+ 3	+ 4	+ 3	+ 3
South India . . .	+ '019	+ '024	+ '034	+ '029	+ 2	+ 4	+ 3	+ 3

(3) The air was much drier than usual at almost all the hill stations in Northern India in October and November and damper on the mean of the month in December, as is shown by the following data :—

STATION.	VARIATION OF MEAN ABSOLUTE HUMIDITY FROM NORMAL IN				VARIATION OF MEAN RELATIVE HUMIDITY FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period November and December 1898.	October 1898.	November 1898.	December 1898.	Period November and December 1898.
Leh . . .	+ '008	+ '012	— '017	— '002	+ 4	+ 4	— 7	— 1
Srinagar . . .	+ '072	+ '004	+ '001	+ '002	+ 3	— 10	— 1	— 5
Murree . . .	— '014	— '032	— '002	— '017	— 6	— 11	+ 4	— 3
Simla . . .	— '009	— '036	+ '003	— '016	— 1	— 8	+ 10	+ 1
Chakrata . . .	— '003	— '034	+ '007	— '013	— 3	— 8	+ 9	0
Ranikhet . . .	— '015	— '038	+ '009	— '014	— 4	— 7	+ 9	+ 1

(4) The air contained less aqueous vapour than usual in Persia and Baluchistan, as is shown by the following statement :—

STATION.	8 A.M. ABSOLUTE HUMIDITY.				
	Actual, October 1898.	Actual, November 1898.	Actual, December 1898.	Mean actual of period November and December 1898.	Variation from normal of period November and December 1898.
Baghdad . . .	'306	'280	'208	'244	—'054
Bushire . . .	'594	'541	'317	'429	—'001
Teheran . . .	'223	'177	'118	'147	—'032
Ispahan . . .	'273	'199	'124	'161	—'034
Muscat . . .	'665	'603	'439	'521	—'090
Kabul . . .	'134	'121	?	?	?
Quetta . . .	'211	'148	'131	'139	—'032

Humidity was also below the average to a moderate extent in that area with the exception of Baluchistan, as is shown below :—

STATION.	8 A.M. RELATIVE HUMIDITY.				
	Actual, October 1898.	Actual, November 1898.	Actual, December 1898.	Period November and December 1898.	Variation from normal of period November and December 1898.
	%	%	%	%	
Baghdad . . .	45	67	75	71	—6
Bushire . . .	62	79	70	74	+3
Teheran . . .	35	59	56	57	—4
Ispahan . . .	54	70	71	70	—9
Muscat . . .	59	66	59	62	—8
Kabul . . .	40	58	?	?	?
Quetta . . .	52	55	78	66	+8

The year.—The means for the whole year are given in the final column of the Tables X and XI.

The following are the more important features of the humidity conditions of the year 1898 in India :—

1st.—The year was slightly drier than usual. The mean humidity of the whole of India for the year was 2 below the normal. The deficiency in 1898 was partly a result of the high temperature of the year, and partly of a deficiency in the amount of aqueous vapour which on the mean of the year was '008' below the normal.

2nd.—On the mean of the year the aqueous vapour pressure was in defect over by far the greater part of India. The deficiency was greatest in the Central Provinces, Deccan, Lower Bengal and the Punjab. The mean humidity of the year was normal in three of the divisions given in Table XI and 3 or upwards below the normal in the areas for which variation data are given below :—

AREA.	ANNUAL VARIATION FROM NORMAL OF	
	Mean absolute humidity.	Mean relative humidity.
	"	
Punjab Plains	—'026	—4
Western Rajputana	—'011	—3
Eastern Rajputana and Central India	—'003	—3
Lower Bengal	—'021	—3
Central Provinces (South) and Berar	—'022	—3
Konkan	—'008	—3
Nerbudda Valley	—'018	—3
Malabar Coast	—'005	—3

The variations were on the whole persistent throughout the year. Thus in Malabar Coast the mean relative humidity value was above the normal in only one out of twelve months, and in Lower Bengal it was below the normal in eleven months. The larger variations for the year hence represent abnormal conditions which were practically persistent throughout the whole year.

The following gives the mean annual variation of the mean aqueous vapour pressure and humidity of the whole of India from the normal for each year from 1875 to 1898 :—

YEAR.	Annual variation of pressure of vapour.	Annual variation of relative humidity.
	"	
1875	—'004	+1
1876	—'017	—1
1877	+ '011	+1
1878	+ '020	0
1879	—'014	—1
1880	— 004	0

YEAR.	Annual variation of pressure of vapour.	Annual variation of relative humidity.	YEAR.	Annual variation of pressure of vapour.	Annual variation of relative humidity.
1881	+ '001	o	1890	- '003	-1
1882	- '008	o	1891	- '007	o
1883	- '013	-1	1892	- '002	-1
1884	- '012	o	1893	+ '007	+3
1885	+ '001	o	1894	+ '013	+2
1886	+ '008	+1	1895	+ '003	o
1887	- '012	-1	1896	- '010	-3
1888	- '005	-1	1897	+ '005	-1
1889	+ '003	-1	1898	- '009	-2

Cloud.

Normal values of the mean monthly and annual amount of cloud at second class stations obtained from the whole of the available data up to the end of the year 1895, were given in Table XXI of the Annual Summary of 1896. These means are the averages of the cloud amounts as registered at 10 A.M. and 4 P.M., and hence represent the mean amount during the day period rather than of the whole 24 hours. Corrections to reduce these means to

true daily means have only been obtained in the case of a few stations.

Variation data of this element of meteorological observation for the year 1898, are given in Tables XIV, XV and XVI. Table XV gives the mean variation data for the eighteen meteorological areas adopted in the geographical summaries of meteorological data in the Annual Reports previous to 1891, and Table XVI gives similar data for ten meteorological provinces of India.

TABLE XIV.—*Comparison of the mean cloud proportion in each month of 1898 with the averages of past years.*

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
BURMA COAST AND BAY ISLANDS.	Port Blair .	+1'6	+1'8	-1'0	+2'0	+1'6	+1'3	+1'4	+0'9	+0'7	+1'5	+1'3	+0'6	+1'1
	Rangoon .	o	+0'9	-1'9	+0'6	+1'9	+0'2	+0'7	+0'9	+0'9	-1'3	-2'0	-0'9	o
	Diamond Is- land.	o	+1'0	-2'2	+0'8	+1'7	+0'1	+1'1	+0'7	+0'8	+0'4	+1'1	+1'3	+0'6
	Cocos Island.	+0'8	-0'4	-1'1	-0'4	-0'2	-0'7	o	-0'9	-0'4	-0'8	-1'4	-0'8	-0'5
	Akyab .	-0'6	+0'3	-1'4	-1'5	-1'3	+0'3	-0'6	+0'1	+0'4	-0'2	-1'8	-1'4	-0'6
ASSAM	Silchar .	-1'2	+0'8	-3'2	-1'0	-0'3	-0'2	+0'3	+0'5	+1'4	-0'2	-0'6	-0'4	-0'3
	Sibsagar .	-0'5	+1'0	-1'7	+1'1	-0'4	-0'6	-0'6	-0'7	-0'5	-1'4	-1'3	+0'2	-0'5
	Dhubri .	-0'4	+0'7	-1'6	+0'2	-1'4	-0'2	+0'2	+0'2	+0'9	-0'2	+0'5	-0'2	-0'1
BENGAL AND ORISSA.	Chittagong .	-1'1	-0'1	-2'2	+0'1	-1'0	+0'4	-0'6	+0'4	+0'5	-0'1	-1'7	-1'6	-0'6
	Narayanganj.	-0'8	+1'1	-2'6	+0'4	+1'0	+0'5	+0'6	+0'9	+1'2	+0'8	o	-0'3	+0'2
	Calcutta (Ali- pore.)	-0'8	+0'4	-2'4	-0'6	-0'5	+0'6	+0'5	+0'6	+0'9	+0'2	-0'7	-0'7	-0'2
	Saugor Island	-1'0	+0'2	-3'1	+0'9	-0'6	+0'2	+0'5	+1'5	+1'0	+0'1	-0'7	-1'0	-0'2
	Burdwan .	-1'1	-0'2	-2'1	-1'2	-0'9	-0'4	-0'2	+0'3	-0'2	-1'1	-0'9	-0'7	-0'7
	Berhampore .	-1'4	+0'3	-2'5	-1'6	-1'2	-0'7	-0'5	-0'2	-0'3	-1'6	-1'0	-0'9	-1'0
	False Point .	-1'9	-0'6	-2'6	+0'5	-0'4	+0'6	+0'5	+0'9	+0'6	o	o	-0'1	-0'2
	Cuttack .	-1'4	o	-2'1	-0'5	-0'3	+0'3	+0'9	+0'7	-0'7	-1'2	-0'3	-0'3	-0'4

TABLE XIV.—Comparison of the mean cloud proportion in each month of 1898 with the averages of past years—contd.

METEOROLOGICAL PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
GANGETIC PLAIN AND CHOTA NAGPUR.	Hazaribagh .	—1·8	+1·4	—2·3	—1·4	—0·1	+0·6	+0·5	+1·0	+0·8	—1·4	—0·2	0	—0·2
	Patna .	—2·1	+0·3	—2·3	—1·0	—1·0	—0·4	—0·4	+0·3	+0·1	—1·6	—0·9	—0·9	—0·8
	Darbhanga .	—0·9	+0·1	—1·2	—0·3	—0·5	+0·2	—0·6	+0·1	+0·7	—0·9	—0·1	—0·3	—0·3
	Allahabad .	—1·8	+0·4	—1·1	—1·0	—0·3	+0·8	+0·8	+1·0	+0·7	—0·8	+0·7	+0·3	0
	Lucknow .	—2·7	—1·0	—1·5	—1·7	—0·8	+1·2	+0·7	+0·5	+0·9	—1·6	—0·4	+0·6	—0·5
UPPER SUB-HIMALAYAS.	Dehra Dun .	—1·5	+0·2	—0·7	—1·5	+1·4	+0·6	—0·2	+0·8	+0·4	—0·2	—0·8	+2·9	+0·1
	Roorkee .	—1·7	—0·2	—0·4	—1·4	+0·4	—0·5	+0·4	+0·2	—0·1	—0·6	—0·4	+2·1	—0·2
	Meerut .	—2·5	+0·3	—0·1	—1·5	0	—1·1	—0·2	0	—0·8	—0·7	—0·4	+2·1	—0·4
	Lahore .	—1·6	—0·3	—0·1	—0·5	—0·2	—2·1	—0·3	—1·2	+0·2	—0·6	—0·8	+1·1	—0·5
	Ludhiana .	—1·5	—0·3	—0·4	—0·3	+1·4	—1·9	+0·8	—1·5	+0·3	—0·9	—1·3	+1·6	—0·3
INDUS VALLEY AND NORTH-WEST RAJPUTANA.	Peshawar .	—1·3	—0·6	+0·3	—1·0	+1·3	+0·6	+0·6	—0·8	+0·6	—1·0	—0·8	—0·3	—0·2
	Mooltan .	—1·9	—0·5	—1·4	—0·7	+0·1	—0·1	+0·6	—1·6	—0·3	—0·2	—0·6	0	—0·6
	Jacobabad .	—0·5	—1·5	+0·6	—0·3	+0·8	—0·1	+1·1	—1·6	0	—0·3	—0·6	+0·1	—0·2
	Kurrachee .	—1·7	—1·1	—0·8	—0·9	—0·2	—0·1	—0·7	—0·2	—1·3	—0·8	+0·1	—0·6	—0·7
EAST RAJPUTANA, CENTRAL INDIA AND GUJARAT.	Jeypore .	—1·9	—0·5	—0·4	—0·9	+0·2	—0·9	+0·2	—0·5	+0·4	—1·4	+0·2	+1·6	—0·3
	Ajmere .	—1·3	—0·3	—0·1	—0·7	+0·9	—1·0	+0·9	—0·5	+0·3	—0·7	+0·3	+1·6	—0·1
	Deesa .	—1·8	—1·3	—1·0	—0·6	—0·6	—0·6	+0·3	+0·5	—0·6	—1·7	—0·4	+0·9	—0·6
	Nowgong .	—2·7	—0·9	—1·3	—1·5	—0·1	—0·5	+0·2	+1·2	+0·1	—1·8	?	?	?
	Agra .	—2·0	—0·1	+0·4	—0·8	—0·3	—1·1	+0·7	+0·7	—0·3	—0·8	—0·4	+1·4	—0·2
DECCAN.	Belgaum .	—1·2	+0·3	—1·1	+0·3	—0·5	+0·1	+0·2	+0·2	+0·6	—0·7	—0·4	0	—0·2
	Sholapur .	—1·6	—0·3	—1·1	0	—0·1	+0·5	+0·8	—0·2	—0·4	—1·3	—0·1	—0·2	—0·3
	Poona .	—1·5	—0·4	—0·9	+0·7	+0·7	+0·1	+0·4	+0·3	+0·3	—1·0	+0·3	—0·1	—0·1
	Akola .	—1·4	—0·2	+0·5	—0·3	+0·7	+0·2	0	+0·3	+0·3	—1·4	+1·0	+1·1	+0·1
	Buldana .	—2·0	—1·0	—0·8	—1·2	—0·9	—0·3	+1·0	+1·7	+0·8	—2·6	+0·3	—0·7	—0·5
	Khandwa .	—1·5	—0·5	—0·5	—0·8	+0·4	+0·1	+0·6	+1·3	+0·7	—1·9	+0·1	+0·1	—0·2
	Hoshangabad .	—1·7	—0·4	—0·8	—0·7	+0·1	+0·2	+0·6	+1·4	+0·5	—1·9	—0·3	+0·1	—0·2
	Nagpur .	—2·0	+0·3	—0·3	—0·5	+0·5	+0·2	+0·6	+0·6	+0·1	—1·8	—0·3	0	—0·2
	Jubbulpore .	—2·0	—0·3	—0·9	—0·7	+0·4	+0·1	+0·4	+1·4	+0·2	—1·4	+0·2	+0·2	—0·2
	Saugor .	—1·6	—0·1	—0·2	—0·1	+1·5	+1·5	+1·8	+3·0	+1·3	—1·1	+0·1	+0·6	+0·6
	Sutna .	—1·9	—0·3	—1·3	—1·2	—0·4	—0·6	+0·5	+1·2	—0·3	—1·7	—0·2	—0·4	—0·6
	Raipur .	—1·4	+0·4	—1·4	—0·5	—0·2	—0·4	+0·6	+1·1	+0·4	—1·1	—0·5	0	—0·3
	Hyderabad (Deccan).	—1·3	+0·3	—1·2	—0·3	—0·3	+0·8	+1·2	+0·4	—0·1	+0·4	+0·2	+0·5	+0·1

TABLE XV.—Geographical summary of the cloud data of Table II in the monthly weather reviews of 1898.

METEOROLOGICAL PROVINCE.	Number of stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
North-West Himalaya .	7	—1'9	—0'6	—0'1	—1'2	+0'7	—0'3	+0'2	—0'7	—0'3	—1'0	—0'8	+1'2	—0'4
Sikkim Himalaya and Nepal.	1—2	—0'9	+0'6	—1'0	—1'4	—0'6	+0'1	—0'6	—0'3	+0'3	+1'3	+0'8	+0'4	—0'1
Punjab Plains .	4	—1'6	—0'4	—0'4	—0'6	+0'7	—0'9	+0'4	—1'3	+0'2	—0'7	—0'9	+0'6	—0'4
Gangetic Plain .	8	—1'9	0	—0'9	—1'2	—0'1	0	+0'2	+0'5	+0'2	—0'9	—0'3	+1'0	—0'3
Western Rajputana .	4	—1'5	—1'2	—0'6	—0'6	—0'2	—0'3	+0'1	—0'6	—0'7	—1'1	—0'2	+0'5	—0'5
Eastern Rajputana and Central India.	4—5	—1'9	—0'4	—0'7	—0'9	+0'4	—0'3	+0'7	+0'9	+0'4	—1'7	+0'1	+0'9	—0'2
Nerbudda Valley .	3	—1'7	—0'4	—0'7	—0'7	+0'3	+0'1	+0'5	+1'4	+0'5	—1'7	0	+0'1	—0'2
Chota Nagpur .	1	—1'8	+1'4	—2'3	—1'4	—0'1	+0'6	+0'5	+1'0	+0'8	—1'4	—0'2	0	—0'2
Lower Bengal .	5	—1'0	+0'4	—2'5	—0'4	—0'4	0	+0'2	+0'6	+0'5	—0'3	—0'7	—0'7	—0'8
Assam and Cachar .	3	—0'7	+0'8	—2'2	+0'1	—0'7	—0'3	0	0	+0'6	—0'6	—0'5	—0'1	—0'3
Orissa and Sambalpur .	2	—1'7	—0'3	—2'4	0	—0'3	+0'5	+0'7	+0'8	—0'1	—0'6	—0'2	—0'2	—0'3
Central Provinces (South) and Berar.	6	—1'8	—0'2	—0'4	—0'6	+0'1	—0'2	+0'2	+0'7	+0'2	—1'8	0	0	—0'3
Konkan .	3	—0'8	+0'2	—0'5	—0'3	—0'3	0	+0'6	+0'4	+0'7	—0'7	+0'3	0	0
Malabar Coast .	1	—0'2	—0'1	—1'5	+0'8	—0'7	+0'7	+0'5	—0'4	+1'7	+1'5	+1'3	+0'9	+0'4
Deccan, Hyderabad and Mysore.	10	—1'4	+0'9	—1'2	+0'3	+0'2	+0'7	+0'7	+0'3	+0'8	+0'2	+0'5	+0'3	+0'2
East Coast and Carnatic	5	—0'8	+0'6	—1'1	+0'1	—0'7	+0'4	+0'7	—0'4	0	0	+0'9	—0'2	0
Arakan and Pegu .	4	—0'4	+0'5	—1'9	0	+0'3	+0'3	+0'2	+0'5	+0'7	—0'3	—1'1	—0'7	—0'2
Bay Islands .	2	+1'2	+0'7	—1'0	+0'8	+0'7	+0'3	+0'7	0	+0'2	+0'4	0	—0'1	+0'3
Extra-Tropical .	42—44	—1'6	—0'2	—1'0	—0'8	0	—0'2	+0'3	+0'1	+0'1	—0'9	—0'4	+0'5	—0'3
Tropical .	32	—1'0	+0'5	—1'2	0	0	+0'3	+0'5	+0'3	+0'4	—0'3	+0'2	0	0
Whole of India .	74—76	—1'3	+0'1	—1'1	—0'4	0	0	+0'4	+0'2	+0'3	—0'6	—0'1	+0'3	—0'2

TABLE XVI.—Variations of the mean cloud amount from the normal in ten meteorological provinces of India in 1898.

METEOROLOGICAL PROVINCE.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
Burma Coast and Bay Islands .	+0'4	+0'7	—1'6	+0'3	+1'0	+0'2	+0'7	+0'7	+0'7	+0'1	—0'7	—0'1	+0'2
Assam .	—0'7	+0'8	—2'2	+0'1	—0'7	—0'3	0	0	+0'6	—0'6	—0'5	—0'1	—0'3
Bengal and Orissa .	—1'2	+0'1	—2'5	+0'3	—0'5	+0'2	+0'2	+0'6	+0'4	—0'4	—0'7	—0'7	—0'4
Gangetic Plain and Chota Nagpur.	—1'9	+0'2	—1'7	—1'1	—0'5	+0'5	+0'2	+0'6	+0'6	—1'3	—0'2	—0'1	—0'4
Upper Sub-Himalayas .	—1'8	—0'1	—0'3	—1'0	+0'6	—1'0	+0'1	—0'3	0	—0'6	—0'7	+2'0	—0'3
Indus Valley and North West Rajputana.	—1'4	—0'9	—0'3	—0'7	+0'5	+0'1	+0'4	—1'1	—0'3	—0'6	—0'5	—0'2	—0'4
East Rajputana, Central India and Gujarat.	—1'9	—0'6	—0'5	—0'9	0	—0'8	+0'5	+0'3	0	—1'3	—0'1	+1'4	—0'3
Deccan .	—1'6	—0'2	—0'8	0	+0'1	+0'2	+0'7	+1'0	+0'3	—1'3	0	+0'1	—0'1
West Coast .	—0'6	+0'1	—0'8	0	—0'4	+0'2	+0'6	+0'2	+0'9	—0'2	+0'6	+0'3	+0'1
South India .	—1'1	+1'1	—1'2	+0'3	0	+0'7	+0'7	0	+1'0	+0'4	+0'8	+0'2	+0'2

I.—The Cold weather period.—The weather was less disturbed than usual during the greater part of this period and the amount of cloud was hence throughout considerably below the normal in North-Western India. The following gives comparative data :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.
Baluchistan	—0'4	—1'1	—0'7
Punjab	—1'6	—0'4	—1 0
Sind	—1'1	—1'3	—1'2
North-Western Provinces and Oudh .	—2'0	—0'1	—1'0
Rajputana	—1'7	—0'7	—1'2
Central India	—2'3	—0'6	—1'4
Berar	—1'7	—0'6	—1'1
Central Provinces	—1'7	—0'1	—0'9

The amount of cloud was as largely below the normal at the hill stations in North-Western India as in the adjacent plains, as is shown below :—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.
Leh	—1'0	—0'2	—0'6
Murree	—2'5	—2'7	—2'6
Simla	—2'7	+0'7	—1'0
Chakrata	—2'1	—0'8	—1'4
Ranikhet	—2'7	—0'1	—1'4
Mount Abu	—2'1	—0'9	—1'5
Quetta	—0'4	—1'1	—0'7
Pachmarhi	—2'1	—0'3	—1'2

There was a considerable deficiency of cloud in North-Eastern India, the Deccan and Southern India in January, and a slight to moderate excess in February. Hence, on the mean of the period cloud was normal or in slight defect, except in the Madras Deccan where it was in light local excess. The following gives comparative data :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.
Assam	—0'7	+0'8	0
Bengal	—1'0	+0'3	—0'3
Bihar	—1'5	+0'2	—0'6
Chota Nagpur	—1'8	+1'4	—0 2
Bombay Coast	—0'6	+0'1	—0'2
Bombay Deccan	—1'4	—0'1	—0'7
Madras Coast	—0'9	+0'7	—0'1
Madras Deccan	—1'2	+2'5	+0'6
Mysore	—1'4	+1'4	0
South India	—0'7	+0'4	—0'1

Cloud was throughout the period in excess over the Andaman Sea and adjacent coasts, as is shown below :—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN		
	January 1898.	February 1898.	Period January and February 1898.
Port Blair	+1'6	+1'8	+1'7
Cocos Island	+0'8	—0'4	+0'2
Diamond Island	0	+1'0	+0'5
Rangoon	0	+0'9	+0'4

II.—The hot weather period.—March and April were very dry months in North-Western India. May was an unusually dry and hot month in North-Eastern India. Weather in May was more disturbed than usual in Upper India, more especially the hill districts, on the higher ranges of which a moderately heavy fall of snow occurred in the second week of the month.

The following is a summary of the chief abnormal features of the distribution of cloud during this season :—

- (1) There was less cloud than usual in the first two months of the period and more cloud in May in Upper India. The following gives data :—

PROVINCE.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Punjab	—0'4	—0'6	+0'7	—0'1
Rajputana	—0'5	—0'7	+0'2	—0'3

The variations in the amount of cloud at the hill stations in Upper India were generally similar to those in the adjacent plains :—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Quetta	+0.3	-0.2	+1.7	+0.6
Leh	+0.6	-0.6	+1.2	+0.4
Kailang	+0.3	-0.4	+1.2	+0.4
Srinagar	+0.7	-0.6	+1.6	+0.6
Murree	-0.1	-1.2	+0.4	-0.3
Simla	-0.2	-1.2	+0.6	-0.3
Chakrata	-0.6	-1.9	+0.2	-0.8
Ranikhet	-1.1	-2.2	-0.2	-1.3

(2). Cloud was in moderate to considerable defect in the North-Western Provinces, Bihar, Chota Nagpur, Bengal and Orissa throughout the period. The following gives data :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
North-Western Provinces and Oudh.	-0.6	-1.3	-0.3	-0.7
Bihar	-1.8	-0.7	-0.8	-1.1
Chota Nagpur	-2.3	-1.4	-0.1	-1.3
Bengal	-2.5	-0.3	-0.5	-1.1
Orissa	-2.4	0	-0.4	-0.9

(3). Cloud was in slight to large defect throughout the period in Cachar, as is shown below :—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Silchar	-3.2	-1.0	-0.3	-1.5

(4). Cloud was in moderate to considerable defect in the Deccan, Berar, the Central Provinces and Mysore in March and was in slight to moderate defect in April and

May in the eastern half of the peninsula and in slight to moderate excess in the western half of the peninsula. It was hence on the mean of the period practically normal in amount, as is shown below :—

DIVISION.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Central Provinces	-0.7	-0.6	+0.5	-0.3
Berar	-0.2	-0.8	-0.1	-0.4
Bombay Deccan	-1.0	+0.3	0	-0.2
Madras Deccan	-0.8	+1.4	+1.4	+0.7
Mysore	-1.6	+0.2	+0.5	-0.3
Bombay Coast	-0.8	0	-0.4	-0.4
Madras Coast	-0.6	+0.5	-0.3	-0.1

III.—The South-West monsoon period.—The variations in the distribution of cloud from the normal during this period were very persistent. The monsoon currents, but more especially the Bengal current, were remarkably steady and of at least normal strength as rain-giving currents throughout the whole period from June to September. The following gives the chief abnormal features of the distribution of cloud in this season :—

(1) The only area in which there was a marked tendency to deficient rainfall was Upper India including the Punjab, Rajputana and parts of the Sind. Cloud was normal or deficient in these areas in June, August and September and was in slight excess in July. It was in slight excess in Baluchistan from June to August and in slight defect in September, as is shown below :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Baluchistan	+0.2	+1.5	+0.7	-0.4	+0.5
Sind	-0.1	+0.2	-0.9	-0.7	-0.4
Punjab	-0.9	+0.4	-1.3	+0.2	-0.4
Rajputana	-0.8	+0.5	-0.2	0	-0.1

(2) There was a slight tendency to excess cloud in Southern India. The following gives com-

parative data for three representative stations:—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Cochin	+0.7	+0.5	—0.4	+1.7	+0.6
Salem	+0.7	+1.1	—0.1	+2.0	+0.9
Madras	+0.5	+0.6	0	+0.7	+0.4

(3) Cloud was persistently in excess over the remainder of India during the greater part of the period from June to September, as is shown below:—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN				
	June 1898.	July 1898.	August 1898.	September 1898.	Period June to September 1898.
Burma	+0.2	+0.4	+0.6	+0.7	+0.5
Bengal	+0.1	+0.1	+0.6	+0.5	+0.3
Bihar	—0.1	—0.5	+0.2	+0.4	0
Chota Nagpur	+0.6	+0.5	+1.0	+0.8	+0.7
North-Western Provinces and Oudh.	0	+0.4	+0.5	+0.1	+0.2
Central India	—0.6	+0.4	+1.2	—0.1	+0.2
Central Provinces	+0.3	+0.8	+1.5	+0.5	+0.8
Berar	—0.1	+0.5	+1.0	+0.6	+0.5
Konkan	0	+0.6	+0.4	+0.7	+0.4
Bombay Deccan	+0.2	+0.5	+0.1	+0.2	+0.2
Madras Deccan	+0.9	+1.1	+0.9	+1.5	+1.1

Cloud differed only very slightly from the normal amount in June. It was in moderate excess in July, August and September, and the excess was moderate to considerable in amount locally in Chota Nagpur, the Central Provinces, Berar and Central India in August.

IV.—The retreating monsoon.—The south-west monsoon currents retreated slightly earlier than usual from Northern India and considerably earlier from Burma and the Deccan. From the fourth week of October the retreating monsoon current was chiefly determined to the south-west of the Bay and Southern India. There was hence less cloud than usual during the period in Burma,

Northern and Central India and the North Deccan, and more cloud than usual in Southern India. These features were very persistent during the period over nearly the whole area. The only exception was Upper India in the month of December. Weather was very disturbed, with much cloud, in the plains and heavy rain or snow in the hills during the last week of the month and the mean amount of cloud was hence in excess in that month and slightly to considerably below the normal in October and November. The following gives comparative data for North-Western India:—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Baluchistan	—0.3	—0.2	+0.5	0
Sind	—0.6	—0.3	—0.3	—0.4
Punjab	—0.7	—0.9	+0.6	—0.3
Rajputana	—1.3	0	+1.4	0
Central India	—1.8	—0.2	—0.4	—0.8
North-Western Provinces and Oudh	—0.8	—0.3	+1.6	+0.2

(2). The variations in the hill districts in Upper India were similar to those of the adjacent plains, but more pronounced, as is shown by the following data:—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Leh	—1.2	—0.5	+1.1	—0.2
Murree	—1.8	—1.3	—1.9	—1.7
Simla	—1.0	—1.1	+2.2	0
Chakrata	—0.5	—0.6	+1.8	+0.2
Ranikhet	—0.4	—0.6	+3.4	+0.8
Mount Abu	—1.5	+0.1	+1.5	0
Quetta	—0.3	—0.2	+0.5	0

(3) Cloud was in persistent defect throughout the period in Burma, North-Eastern India and the Bombay Deccan. It was in moderate to considerable defect in the Central Provinces, Berar and the Konkan in October, and normal or in slight excess in November and December.

The following gives comparative data :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Burma	—0'4	—0'9	—0'3	—0'5
Assam	—0'6	—0'5	—0'1	—0'4
Bengal	—0'3	—0'8	—0'9	—0'7
Bihar	—1'3	—0'5	—0'6	—0'8
Chota Nagpur	—1'4	—0'2	0	—0'5
Central Provinces	—1'5	—0'1	+0'2	—0'5
Berar	—2'0	+0'7	+0'2	—0'4
Bombay Deccan	—1'0	—0'1	—0'1	—0'4
Konkan	—0'7	+0'3	0	—0'1

(4) There was throughout the period more cloud than usual in the south-east of the Bay and in the Peninsula south of lat. 16°N. :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Port Blair	+1'5	+1'3	+0'6	+1'1
Madras Coast	+0'1	+0'5	—0'2	+0'1
Madras Deccan	+1'7	+1'8	+1'5	+1'7
Mysore	+0'9	+0'9	+0'5	+0'8
South Madras	+0'7	+1'3	+0'3	+0'8
Malabar	+1'5	+1'3	+0'9	+1'2

(5) Cloud was considerably above the normal at Aden, Muscat and Baghdad and in slight defect at Bushire, as is shown below :—

STATION.	VARIATION OF CLOUD AMOUNT FROM NORMAL IN			
	October 1898.	November 1898.	December 1898.	Period October to December 1898.
Baghdad	+0'2	+1'9	+1'0	+1'0
Bushire	—0'7	—0'5	—0'9	—0'7
Aden	+0'8	+1'4	+0'9	+1'0
Muscat	+0'1	+1'3	+0'7	+0'7

The year.—The mean cloud amount of the year in India was 0'2 below the normal. The variations in Tropical India and Extra-Tropical India and also of the whole of India for each of the four periods of the year are given below :—

AREA.	VARIATION OF MEAN CLOUD AMOUNT FROM NORMAL IN				
	I Period.	II Period.	III Period.	IV Period.	Whole year.
Extra-Tropical India	—0'9	—0'6	+0'1	—0'3	—0'3
Tropical India	—0'3	—0'4	+0'4	0	0
Whole India	—0'6	—0'5	+0'2	—0'1	—0'2

The following table gives the variation of the mean amount of cloud in the Indian area, year by year, from 1875 to 1898 :—

YEAR.	Amount of variation.	YEAR.	Amount of variation.
1875	0	1887	—0'1
1876	—0'2	1888	—0'1
1877	+0'3	1889	+0'1
1878	+0'1	1890	+0'2
1879	—0'1	1891	+0'1
1880	—0'1	1892	+0'1
1881	—0'1	1893	+0'5
1882	0	1894	+0'5
1883	+0'1	1895	+0'1
1884	—0'1	1896	—0'2
1885	+0'2	1897	0
1886	+0'2	1898	—0'

Rainfall.

The rainfall data of India are now issued in a separate volume. The eighth volume, that of 1898, contains the rainfall data of 2,265 stations, which are classified under their respective administrative divisions according to the following scheme :—

PROVINCE.	Number of Stations.
Burma	143
Assam	112
Bengal, Bihar, Chota Nagpur and Orissa	347
North-Western Provinces and Oudh	279
Punjab	211
Bombay	278
Madras	364
Coorg	10
Central Provinces	65
Berar	44
Mysore	80
Baluchistan	44
Kashmir	20
Rajputana	131
Central India	61
Hyderabad (Deccan)	23
Travancore	39
Cochin	3
Pudukota	11

The volume contains the whole of the available information for the year 1898 of this important element of meteorological observation.

The information includes monthly statements of—

- the actual rainfall, day by day, of all the rainfall stations ;
- the total rainfall of the month ;
- the number of rainy days during the month ;
- the average or normal rainfall of the month for all stations for which rainfall data of at least five years are available ;
- the average or normal number of rainy days of the month for all stations for which rainfall data of five years or upwards are available ;
- the accumulated rainfall (up to the date of each statement) throughout each of the seasons into which the year is divided.

Symons' rain-gauges are now used at all rain-gauge stations, with the exception of those in Mysore. The

hour of measuring rainfall is 8 A.M. throughout India, and the amounts registered give the rainfall of the previous 24 hours, and hence generally of the rainfall of the previous civil day.

In Table XXV of the Annual Summary for 1896 are given the normal means of rainfall for 535 stations determined from the whole of the available data down to December 1896. The stations for which the means are given were selected by Mr. Blandford, and normal means were given in the rainfall sections of the Annual Reports on the Meteorology of India. The last previous series of means were given in the Annual Report on the Meteorology of India for 1890. The normal means in Table XXV of the Annual Summary for 1896 are hence based on six years additional data. This period, however, includes the three years 1892—94 of abnormally heavy rainfall, and hence the means given in this table are in almost all cases higher than those given in Table XXXI of the Annual Report on the Meteorology of India for 1890. The following gives six instances of the considerable apparent increase in the mean rainfall :—

PROVINCE.	STATION.	Average annual rainfall based on data up to 1890.	Average annual rainfall based on data up to 1896.	Increase in average result.
		Inches.	Inches.	Inches.
BOMBAY	Lanavla	164'24	172'75	+8'51
Do.	Jetal'ar	23'60	30'39	+6'79
BENGAL AND ORISSA	Keonjhar	31'29	37'98	+6'69
Do.	Narsingpur	39'02	44'72	+5'70
Do.	Bispara	49'69	55'07	+5'38
CENTRAL PROVINCES	Sarangarh	50'50	55'84	+5'34

Table XVII gives the variations of the monthly and annual rainfall in 1898 of 531 stations in India, Baluchistan, and Burma.

The following four tables (Tables XVIII to XXI) give summaries of the rainfall data of the year. In the first two tables (Tables XVIII and XIX) the summaries are drawn up in the form that was used for many years in the Annual Reports issued by the Department and are based on the rainfall returns of 386 selected stations. In the two succeeding tables (Tables XX and XXI) the actual average rainfall data (derived from the returns of 2,266 rain-gauge stations in India) are given for the 57 meteorological districts into which the Empire is divided for the comparison of crops and rainfall for the four periods into

which the year may be divided. These four periods are as follows:—

- 1st.—From January 1st to February 28th, which forms the period of the cold weather rains of Upper India.
- 2nd.—From March 1st to May 31st, which includes the hot season, when rain occurs mainly in the coast districts, and in Assam during thunderstorms.

3rd.—From June 1st to October 31st, which forms the period of the south-west monsoon rain proper.

4th.—From November 1st to December 31st, which includes the period of the so-called north-east monsoon rains of Southern India, more especially of the Coromandel coast districts.

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BALUCHISTAN.	Kalat . . .	—1'88	—1'83	+0'72	—0'51	+0'69	—0'01	—0'43	—0'52	—0'05	—0'07	—0'35	—0'16	—5'40
	Pishin . . .	—2'65	—1'71	+1'57	—0'94	+0'50	—0'06	—0'21	—0'21	—0'01	—0'06	—0'75	—0'85	—5'38
	Chaman . . .	—1'23	—1'93	—0'25	—0'44	+0'13	—0'22	—0'29	0	0	—0'09	?	—0'65	—5'85?
	Quetta . . .	—1'95	—0'75	+1'79	—1'06	+0'20	—0'19	+0'04	—0'62	—0'13	—0'09	—0'31	—0'42	—3'49
	Mach . . .	—2'16	—1'56	+0'36	+1'11	+0'30	—1'25	—0'53	—0'54	—0'05	—0'62	—0'21	—0'70	—5'85
	Beleli . . .	—2'35	—1'81	+1'83	—0'79	+0'07	—0'22	—0'11	—0'56	—0'04	—0'10	—0'93	—1'25	—6'26
	Kuchlak . . .	—2'17	—1'39	+1'64	—0'68	+0'17	—0'13	—0'09	—0'25	—0'19	—0'13	—0'85	—1'75	—5'82
	Fort Sandeman.	—0'93	—0'79	—1'41	—0'56	+0'71	—0'81	—1'66	—1'35	+0'05	—0'10	—0'56	—0'16	—7'57
	Bostan . . .	—2'00	—2'22	+2'38	—0'77	+0'30	—0'29	—0'26	—0'26	—0'04	—0'12	—0'76	—1'89	—5'93
	Yarookarez . .	—1'78	—1'61	+1'72	—0'54	+0'33	—0'08	—0'02	—0'23	0	—0'07	—0'46	—1'44	—4'18
	Syad Hamed . .	—2'04	—2'49	+1'78	—0'41	+0'31	—0'01	0	—0'13	0	—0'10	—1'06	—0'87	—5'02
	Gulistan . . .	—1'82	—1'98	+1'65	—0'49	+0'12	—0'07	—0'05	0	—0'06	—0'10	—0'91	—0'88	—4'59
	Kil'la Abdulla .	—2'15	—2'10	+3'97	—0'70	+0'46	—0'05	—0'13	—0'04	—0'03	—0'15	—1'29	—1'04	—3'25
	Khanai . . .	—2'05	—2'97	+1'54	—0'94	0	—0'28	—0'14	—0'30	0	—0'11	—0'64	—1'49	—7'38
	Fuller's Camp .	—2'92	—2'25	+0'63	—1'05	+0'11	—0'16	—0'33	—0'22	—0'09	—0'13	—0'96	—1'16	—8'53
	Kachh . . .	—1'94	—0'24	+2'30	—0'93	+0'44	—0'36	+0'19	—0'23	—0'14	—0'10	—0'92	—1'10	—3'03
	Kachkotal . . .	—1'08	+0'82	+1'86	—0'74				Closed.					
	Mudgorge . . .	—2'57	—0'96	+2'51	—0'44	+0'30	—0'32	+0'23	—0'44	—0'06	—0'13	—1'23	—0'84	—3'95
	Mangi . . .	—1'16	—0'62	+2'18	—0'61	+0'28	—0'79	—0'21	—0'36	—0'06	—0'13	—0'99	—1'21	—3'68
	Dirgi . . .	—1'56	—0'57	+2'02	—0'56	+0'32	—0'68	—0'29	—0'48	+1'51	—0'09	—0'78	—1'29	—2'45
	Khost . . .	—2'30	—0'58	+1'42	—0'21	+0'03	—0'67	+0'58	—0'68	—0'24	—0'29	—1'34	—1'36	—5'64
	Shabrig . . .	—2'51	—0'59	+0'07	—0'23	—0'39	—1'25	+1'65	—2'10	—0'54	—0'17	—0'98	—1'05	—8'09
	Nasak . . .	—1'61	+0'53	+0'45	—0'25	—0'24	—1'69	+0'37	—2'77	—0'59	—0'13	—1'00	—1'07	—9'06
	Harnai . . .	—1'71	+0'05	+0'09	—0'30	0	—1'67	+1'98	—2'24	—0'38	—0'12	—0'80	—1'22	—6'32
	Sunari . . .	—1'36	—0'55	—0'08	—0'32	—0'10	—1'39	—0'53	—2'88	+0'44	—0'12	—0'70	—0'89	—8'48
	Spintangi . . .	—0'91	—0'93	—0'23	—0'30	—0'28	—1'11	+0'97	—2'34	—0'31	0	—0'57	—0'80	—6'81
	Mosbkof . . .	?	?	—0'46	—0'06	0	—0'33	+3'46	—0'05	—0'02	0	—0'17	—0'06	?
	Baber Kach . .	—0'87	—0'63	—0'20	—0'09	—0'16	—0'49	+0'84	—1'26	—0'34	—0'04	—0'41	—0'52	—4'17
	Loralai (Hospital)	—1'11	—0'04	—0'56	—0'30	+0'35	—0'70	+0'56	—0'34	—0'20	—0'19	—0'40	—0'38	—3'31

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BALUCHISTAN—contd.	Nari . . .	—0'76	—0'40	—0'21	—0'08	—0'04	—0'35	+0'50	—0'99	—0'22	—0'01	—0'32	—0'49	—3'37
	Sibi . . .	—0'83	—0'09	—0'27	—0'10	+0'33	—0'30	+0'41	—1'05	—0'12	0	—0'26	—0'56	—2'84
	Kolepur . . .	—1'35	—1'24	+2'60	—0'49	+0'54	—0'16	—0'89	—0'76	—0'21	—0'06	—0'34	—0'71	—3'27
	Herok . . .	—3'26	—2'22	+0'40	—0'59	+0'26	—0'58	—0'76	—1'31	—0'33	—0'11	—1'48	—1'10	—11'08
	Mihtri . . .	—0'69	—0'26	—0'25	—0'15	+0'13	—0'28	+2'30	—0'42	0	—0'03	—0'23	—0'42	—0'30
	Lindsay . . .	—0'51	—0'53	—0'26	—0'11	+0'28	—0'23	+1'47	—0'74	—0'12	0	—0'19	—0'31	—1'25
	Bellput . . .	—0'45	—0'22	—0'14	—0'05	—2'90	+0'15	+3'21	—0'81	—0'03	0	—0'28	—0'16	+0'99
	Nuttal . . .	—0'59	—0'41	—0'19	—0'09	—0'17	—0'11	+1'25	—1'06	—0'20	0	—0'56	—0'36	—2'49
	Temple Derei . . .	—0'61	—0'46	—0'11	—0'07	—0'06	—0'33	+2'03	—1'16	—0'03	0	—0'33	—0'16	—1'29
	Jhatput . . .	—0'37	—0'43	—0'11	—0'03	+0'22	—0'16	+0'50	—0'77	—0'17	0	—0'29	—0'14	—1'75
	Sangal . . .	—1'86	—1'47	+0'92	—0'52	+0'88	—0'02	—0'38	—0'09	0	—0'19	—0'74	—0'39	—3'86
	Shalabagh . . .	—3'04	—3'13	+1'79	—0'56	+0'31	—0'04	—0'71	0	0	—0'16	—0'69	—1'42	—7'65
	Panir . . .	—1'15	—0'26	—0'48	0	+0'21	—0'31	+0'43	—0'34	—0'04	—0'01	—0'14	—0'36	—2'45
	Abbottabad . . .	—1'15	+1'78	—0'32	—1'24	+0'91	+0'77	+0'77	+0'91	+3'11	—1'17	—1'01	—0'46	+2'90
	Murree (Obsy.) . . .	—2'26	+1'40	—0'83	—2'96	—0'24	—1'23	+3'68	+1'92	+2'73	—2'00	—1'49	+0'08	—1'20
	Dharmasala . . .	—3'77	+4'43	—3'45	—1'86	—0'63	+1'74	+6'02	+0'28	—6'46	—1'10	—0'38	+4'05	—1'13
	Kailang . . .	—2'33	—0'26	—2'22	—1'58	+0'88	—1'15	+1'71	+0'46	—1'48	—0'52	—0'58	+2'56	—4'61
	Kilba . . .	—4'69	—1'02	—5'79	—3'17	—1'73	—1'81	—0'85	—2'22	—3'35	—1'23	—1'58	+2'53	—24'91
	Simla (Obsy.) . . .	—2'50	+2'11	—2'56	—1'51	—2'68	+0'96	—8'54	+0'73	—3'78	—1'30	—0'32	+1'88	—17'51
	Peshawar (Obsy.) . . .	—1'52	+1'37	+0'48	—1'36	+0'77	—0'23	+2'52	—1'81	+0'74	—0'20	—0'64	—0'14	—0'02
	Kohat . . .	—1'26	+1'94	—0'50	—1'54	+0'75	—0'59	—1'59	—0'22	—0'23	—0'52	—0'70	+0'14	—4'32
	Banna . . .	—0'82	+1'61	—0'29	—1'10	+0'10	—0'89	+4'22	—2'70	—0'34	—0'15	—0'30	—0'23	—0'89
	Dera Ismail Khar . . .	—0'47	+4'04	—0'83	—0'71	+0'04	—0'69	—1'50	—1'44	+0'12	—0'11	—0'16	+0'14	—1'57
	Dera Ghazi Khan . . .	—0'44	+0'34	—0'62	—0'31	+0'05	—0'39	+0'70	—1'31	+3'32	—0'05	—0'13	—0'25	+0'91
	Muzaffargarh . . .	—0'29	+1'01	—0'38	—0'33	—0'37	—0'38	+0'79	—1'45	+0'54	—0'08	—0'09	—0'27	—1'30
	Mooltan (Obsy.) . . .	—0'26	+0'91	—0'46	—0'27	—0'42	—0'26	—1'26	—1'54	—0'30	—0'08	—0'07	—0'27	—4'28
PUNJAB.	Jhang . . .	—0'54	+0'73	—0'77	—0'39	—0'25	—0'41	—1'26	—2'08	+0'03	—0'15	—0'06	—0'27	—5'42
	Montgomery . . .	—0'27	+0'24	—0'47	—0'22	—0'41	—0'57	—1'50	—2'43	+0'39	—0'14	—0'06	+0'28	—5'16
	Shahpur . . .	—0'19	+1'14	—1'01	—0'63	+1'51	+0'86	+2'19	—3'04	—0'27	—0'16	—0'25	—0'36	—0'21
	Rawalpindi . . .	—1'22	+0'86	—1'20	—2'07	—0'32	—1'44	+2'24	—3'75	+7'83	—0'54	—0'71	—0'20	—0'52
	Thelum . . .	—0'38	+2'50	—1'39	—0'97	+0'29	—1'89	+1'82	+0'91	+1'67	—0'49	—0'27	—0'58	+1'22
	Gujarat . . .	—1'79	+3'44	—1'89	—1'04	+0'60	—2'42	+0'65	—2'86	+0'60	—0'47	—0'24	—0'11	—5'44
	Sialkot (Obsy.) . . .	—1'58	+3'06	—1'68	—1'34	—0'03	—3'51	+1'99	—5'74	+2'74	—0'53	—0'29	—0'28	—5'23
	Gujranwala . . .	—1'52	+2'57	—1'25	—0'75	+0'83	—0'90	+2'05	—3'86	+0'75	—0'46	—0'22	—0'12	—2'88
	Gurdaspur . . .	—2'00	+4'66	—1'52	—0'54	+0'93	+0'36	+0'92	—2'55	+4'44	—0'54	—0'15	+0'35	+4'36
	Lahore . . .	—0'84	+2'12	—0'96	—0'55	+0'23	+0'40	+3'74	—4'67	—1'45	—0'46	—0'13	—0'09	—2'66
	Amritsar . . .	—1'15	+3'55	—0'87	—0'57	+0'06	+0'04	+4'63	—4'73	—2'23	—0'45	—0'20	+0'02	—1'99

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
PUNJAB—contd.	Ferozepore .	—0.79	+4.00	—0.71	—0.50	+0.18	—0.67	+0.71	—5.00	—0.98	—0.55	—0.06	—0.14	—4.51
	Jullundur .	—1.04	+2.41	—1.15	—0.55	—0.72	+0.57	+0.03	—4.13	—1.16	—0.41	—0.10	+0.81	—5.44
	Hoshiarpur .	—1.58	+3.92	—1.36	—0.58	—0.88	—1.38	+5.33	—1.04	+1.80	—0.36	—0.15	+3.59	+7.31
	Ludhiana .	—1.08	+2.92	—1.39	—0.77	—0.95	—0.62	+3.03	—5.99	—1.06	—0.96	—0.09	+1.11	—5.85
	Umballa .	—1.56	+7.72	—0.90	—0.42	—0.52	—0.58	—3.63	—3.16	—0.89	—0.48	—0.26	+0.74	—3.94
	Sirsa .	—0.74	+0.88	—0.45	—0.34	+1.12	—1.29	+0.18	—3.50	—0.76	—0.25	—0.03	—0.08	—5.26
	Hissar .	—0.68	+1.06	—0.54	—0.22	+1.36	+0.34	—0.74	—3.95	—1.23	—0.28	—0.08	+0.58	—4.38
	Rohtak .	—0.90	+0.82	—0.59	—0.24	+1.88	+1.44	+1.15	—3.48	—1.40	—0.37	—0.04	+0.32	—1.41
	Delhi (Obsy.) .	—1.09	+2.31	—0.70	—0.32	—0.13	—2.78	—2.67	—1.87	—3.23	—0.42	+0.21	+0.46	—10.23
	Gurgaon .	—0.94	+1.71	—0.53	—0.14	+0.30	—0.22	—1.82	—2.88	—3.78	—0.37	—0.04	+0.22	—11.49
SIND.	Karnal .	—1.37	+4.84	—0.80	—0.40	—0.82	—0.28	—2.95	—4.90	—2.16	—0.38	+0.82	+0.76	—7.64
	Kurrachew .	—0.73	+0.11	—0.16	—0.14	—0.04	—0.51	—1.05	—1.63	—0.08	—0.05	—0.18	—0.19	—4.65
	Sehwan .	—0.44	+0.87	—0.19	—0.16	+0.23	—0.32	+0.13	—2.59	—0.19	—0.03	—0.13	—0.13	—2.95
	Tatta .	—0.34	—0.14	—0.11	—0.31	—0.02	—1.01	+6.80	—1.70	—0.65	0	—0.22	—0.02	+2.28
	Hyderabad (Obsy.) .	—0.29	+0.13	—0.12	—0.16	—0.02	—0.48	+0.47	—3.14	—0.57	0	—0.12	—0.04	—4.34
	Umarkot .	—0.21	+0.04	—0.12	—0.09	+0.21	—0.70	+1.03	—3.43	+0.18	—0.16	—0.06	—0.02	—3.33
	Shikarpur .	—0.31	—0.23	—0.37	—0.19	+0.24	—0.11	+0.37	—1.64	—0.19	0	—0.14	—0.15	—2.72
	Rohri .	—0.35	—0.33	—0.38	—0.27	—0.17	—0.24	—1.17	—1.33	—0.26	—0.01	—0.12	—0.18	—4.81
	Jacobabad .	—0.25	—0.26	—0.27	—0.18	+0.12	—0.11	+1.67	—1.23	—0.19	—0.01	—0.13	—0.06	—0.90
	Bhuj .	—0.07	0	—0.08	—0.10	—0.15	—1.58	+3.59	—3.12	+0.97	—0.70	—0.09	+0.16	—1.17
CATCH	Rahapur .	—0.03	—0.04	—0.06	—0.06	—0.07	—0.95	+0.01	—3.33	+2.71	—0.54	—0.20	+0.55	—2.01
	Nagar .	—0.15	+0.14	—0.05	—0.03	—0.26	—2.06	—0.35	—5.23	—0.88	—0.27	—0.05	+0.25	—8.94
	Jeysulmere .	—0.34	+0.89	—0.12	—0.06	—0.15	+0.77	—1.90	—2.30	—0.15	0	—0.03	—0.11	—3.50
	Phalodi .	—0.21	+1.73	—0.12	—0.02	—0.33	—0.94	+0.32	—2.55	+1.13	0	0	—0.03	—1.02
	Bickaneer .	—0.39	+1.29	—0.21	—0.16	+0.70	—1.12	—1.13	—2.52	+0.51	—0.09	—0.07	+0.26	—2.93
	Nagar .	—0.40	+0.95	—0.19	—0.05	—0.10	—2.38	+3.31	—4.11	+0.10	—0.06	—0.09	—0.07	—3.09
	Didwana .	—0.53	+0.56	—0.33	—0.07	—0.02	—1.48	—1.14	—5.15	—0.39	—0.15	—0.17	+0.68	—8.19
	Jhunjhnu .	—0.94	+0.50	—0.28	—0.11	+1.34	—1.63	—0.51	—5.52	—2.26	—0.17	—0.06	+0.21	—9.43
	Khetri .	—1.02	—0.03	—0.48	—0.14	+2.23	—1.81	—0.57	—7.62	—2.13	—0.30	—0.12	+0.29	—11.70
	Sikar .	—0.65	+0.26	—0.27	—0.08	+0.57	—1.99	—2.97	—5.15	—1.10	—0.24	—0.14	+0.53	—11.23
RAJPUTA.	Sri Madhopur .	—0.69	+0.93	—0.28	—0.09	+1.09	—2.24	—3.04	—4.80	—0.12	—0.06	—0.23	+0.22	—9.31
	Ulwar .	—0.64	+1.99	—0.30	+0.14	—0.12	—1.82	+1.56	—4.95	—4.53	—0.80	—0.20	—0.10	—12.89
	Bhurtapore .	—0.47	+1.93	—0.27	—0.11	+0.63	+2.37	—1.05	+0.06	—2.31	—0.39	—0.06	—0.24	+0.09
	Bandikui .	—0.51	+0.88	—0.40	—0.06	+0.09	—0.79	+1.33	—1.26	—2.21	—0.12	—0.22	+0.02	—3.25
	Jeypore .	—0.49	+0.36	—0.53	—0.17	+0.76	—0.45	+2.41	—7.09	—0.29	—0.24	—0.18	+0.12	—5.61
	Sambhar .	—0.33	+0.35	—0.25	—0.13	—0.29	—0.95	+0.34	—5.40	—2.98	—0.33	—0.25	+0.07	—10.15
	Kerowlee .	—0.38	+1.58	—0.19	—0.05	+2.30	+1.65	—2.15	—4.53	—4.00	—0.15	—0.11	+0.21	—5.82

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

Province.	Station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
RAJPUTANA—contd.	Lalsot . . .	—0'41	+0'48	—0'17	—0'02	+0'99	—3'05	—0'67	—7'88	—0'18	—0'19	—0'13	—0'10	—11'33
	Tonk . . .	—0'22	+2'09	0	—0'06	—0'01	—2'32	—1'28	—7'38	—1'88	—0'52	—0'08	+0'14	—11'52
	Siwai Madhopur . . .	—0'40	+1'66	—0'25	—0'03	—0'28	—2'91	+0'35	—10'70	+0'57	—0'14	—0'14	+0'28	—11'99
	Deoli . . .	—0'27	+1'59	—0'16	—0'13	+0'03	—1'92	—5'16	—9'16	+0'14	—0'42	—0'14	+0'64	—14'96
	Kotah . . .	—0'28	+0'43	—0'10	—0'05	+0'01	—0'87	—3'89	—2'23	—0'66	—0'37	—0'16	+0'57	—7'60
	Jhalrapatan . . .	—0'23	+0'22	—0'15	—0'04	—0'29	—2'20	—6'49	+5'11	+2'32	—0'97	—0'26	+1'02	—1'96
	Ajmere . . .	—0'35	—0'09	—0'35	—0'09	—0'23	—1'87	—0'13	—5'89	—0'25	—0'24	—0'21	+0'08	—9'62
	Nusseerabad . . .	—0'19	+0'20	—0'12	—0'03	+0'16	—1'61	—1'74	—4'71	+2'82	—0'24	—0'19	+0'63	—5'02
	Malpura . . .	—0'43	+0'28	—0'31	—0'01	+0'08	—0'86	+1'10	—8'13	+2'30	—0'02	—0'03	+0'23	—5'80
	Beawar . . .	—0'24	+0'29	—0'17	—0'12	+0'10	—1'22	—2'62	—5'27	+1'76	—0'18	—0'19	+0'46	—7'40
	Jodhpore . . .	—0'28	+0'42	—0'03	—0'05	+0'17	—1'52	+2'43	—5'15	+0'35	—0'13	—0'12	+0'29	—3'62
	Pachpadra . . .	—0'39	+0'19	—0'12	—0'04	—0'70	—1'75	+6'53	—3'97	—1'83	—0'06	—0'09	+0'33	—1'90
	Jasol . . .	—0'23	+0'35	—0'10	—0'02	0	—1'74	+4'77	—3'78	—0'78	—0'01	—0'21	+0'35	—1'40
	Barmer . . .	—0'20	+0'57	—0'09	—0'01	—0'51	+0'33	+5'16	—2'82	—1'17	—0'04	—0'14	+0'06	+1'14
	Pali . . .	—0'15	—0'03	—0'12	0	+0'35	—1'45	—1'64	—4'60	+2'66	—0'11	—0'29	+0'32	—5'06
	Shahpoora . . .	—0'14	+0'13	—0'17	—0'07	—0'39	+2'35	—0'73	—7'54	+0'24	—0'45	—0'12	+0'75	—6'14
	Erinpura . . .	—0'19	+0'13	—0'11	—0'03	—0'31	—1'35	+0'69	—4'14	+0'27	—0'37	—0'20	+0'47	—5'1
	Sirohee . . .	—0'19	+0'30	—0'11	—0'02	—0'53	—1'37	—2'41	—6'37	+1'11	—0'04	—0'25	+0'87	—9'01
	Mount Abu . . .	—0'15	+0'15	—0'09	—0'03	0	—1'49	—1'84	—10'51	—1'58	—0'78	—0'16	+1'62	—14'86
	Kotra . . .	—0'13	+0'31	—0'04	—0'03	—0'34	—2'68	—2'37	—8'44	+1'33	—0'58	—0'20	+0'60	—12'57
	Oodeypore . . .	—0'10	+0'25	—0'08	—0'12	—0'16	—2'26	—2'25	—5'06	+4'29	—0'44	—0'21	+0'51	—5'63
	Partabgarh . . .	—0'23	+0'66	—0'03	0	—0'50	—3'05	+5'46	—3'33	—2'26	—0'74	—0'31	+0'59	—3'74
	Kherwara . . .	—0'10	+0'27	—0'06	—0'02	—0'40	—2'57	—1'92	—5'94	+1'49	—0'54	—0'16	+0'34	—9'61
	Banswara . . .	—0'30	+1'23	—0'01	—0'01	—0'28	—1'23	+1'41	—2'72	—3'97	—0'78	—0'26	+1'38	—5'54
	Neemuch (Obsy.) . . .	—0'22	+0'39	—0'10	—0'13	—0'46	—1'66	—1'60	—7'02	+7'19	—0'63	—0'18	+0'63	—3'79
	Sirdarpore . . .	—0'18	+0'68	—0'03	—0'02	—0'27	—1'72	+3'63	+6'06	—4'42	—1'11	—0'23	—0'16	+2'23
	Agar . . .	—0'27	+0'40	—0'04	—0'06	—0'47	—0'86	+3'71	+0'29	+1'56	—0'70	—0'20	—0'41	+2'95
CENTRAL INDIA.	Rutlam . . .	—0'19	+0'80	—0'03	—0'02	—0'41	—2'19	+5'52	—0'26	—1'60	—0'98	—0'28	+0'22	+0'58
	Indore . . .	—0'28	+0'29	+0'01	—0'17	—0'39	—1'02	+6'79	+5'27	—3'45	—1'03	—0'28	—0'01	+5'73
	Bhopal (Sehore) . . .	—0'48	+0'10	—0'16	—0'06	—0'35	—3'20	+0'12	+5'71	—2'67	—1'31	—0'43	—0'84	—3'57
	Goona . . .	—0'45	+0'28	—0'21	—0'11	—0'43	—2'93	+3'24	—6'18	—1'75	—0'50	—0'39	+0'27	—9'16
	Morar . . .	—0'45	+3'04	—0'17	—0'10	+0'54	—2'36	—4'11	+1'37	—2'93	—0'50	—0'04	+0'54	—5'17
	Nowgong . . .	—0'60	+1'87	—0'24	—0'09	—0'25	+3'44	+8'12	+7'03	—0'11	—0'71	+0'23	—0'40	+18'29
	Sutna . . .	—0'86	+1'32	—0'43	—0'10	+0'25	+0'07	+2'63	+14'07	—1'06	—2'18	—0'30	—0'22	+13'19
	Nagode . . .	—0'84	+1'90	—0'32	—0'15	—0'39	+2'36	+2'35	+8'94	—0'76	—2'15	—0'19	—0'34	+10'41
	Maihar . . .	—0'68	+2'64	—0'33	—0'09	—0'39	—2'01	+2'53	+2'56	—1'50	—2'25	—0'53	—0'32	—0'37
	Rewah . . .	—0'79	+1'79	—0'22	—0'22	—0'42	+1'51	+1'98	+10'14	+1'01	—2'42	—0'33	—0'26	+11'77

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
CENTRAL INDIA — <i>concl.</i>	Chandia .	—0·88	+2·47	—0·38	—0·12	—0·35	+5·10	+8·27	—0·01	—1·48	—2·38	—0·31	—0·36	+9·57
	Ramnagar .	—0·82	+2·39	—0·32	—0·06	—0·39	—3·85	+5·57	+5·67	—0·26	—2·43	—0·37	—0·52	+4·61
	Sihawal (Bardi)	—0·91	+2·12	—0·69	—0·07	—0·32	—1·88	+0·50	+2·42	+1·04	—1·48	—0·60	—0·38	—0·25
	Tyonthar .	—0·87	+0·78	—0·01	—0·06	—0·27	—0·61	+2·42	+3·47	+1·73	—2·52	—0·22	—0·33	+3·51
	Sohagpur .	—1·26	+1·53	—0·57	—0·40	—0·34	—5·16	+1·66	—2·65	+2·57	—2·20	—0·97	—0·54	—8·33
	Chakrata .	—1·85	+4·95	—2·59	—1·33	—0·76	+4·50	+2·25	+2·35	—2·37	—0·76	—0·14	+3·21	+7·46
	Mussooree .	—2·25	+5·90	—2·58	—1·42	—0·90	+10·76	+8·85	—4·11	+0·74	—1·04	+2·00	+2·63	+18·58
	Srinagar .	—2·23	+1·19	—1·77	—0·83	—0·34	+3·04	+1·44	—3·17	+0·73	—0·56	+0·25	+1·37	—0·88
	Pauri .	—2·31	+2·91	—1·96	—0·85	+1·37	+3·06	+1·65	—2·54	+0·14	—0·83	+0·33	+2·20	+3·19
	Ranikhet .	—2·38	+4·03	—1·91	—0·68	—0·74	—0·70	+4·06	+2·08	—2·76	—1·46	+0·62	+1·66	+1·82
	Almora .	—1·88	+3·72	—0·61	—0·44	—1·48	+1·17	—2·31	+4·75	—0·56	—0·79	+1·07	+1·62	+4·26
	Pithoragarh .	—1·92	+3·17	—1·88	—0·39	+1·23	+6·74	+1·56	+6·14	—2·36	—1·49	+1·30	+1·04	+13·14
	Naini Tal .	—3·18	+7·21	—2·38	—1·31	—2·04	—6·07	—4·54	+21·13	—1·81	—1·83	+1·26	+1·84	+8·28
	Dehra Dun .	—1·99	+2·16	—1·24	+0·94	—0·84	—0·87	+4·16	+22·16	+14·40	—0·89	+0·81	+2·69	+11·49
	Saharanpur .	—1·52	+4·10	—1·00	—0·11	—0·65	—0·51	—1·25	+1·81	+1·37	—0·45	+0·37	+0·36	+2·52
	Roorkee .	—1·89	+3·77	—0·90	—0·01	—0·90	—1·90	—0·39	+4·12	—1·85	—0·60	+0·21	+2·17	+1·83
NORTH-WESTERN PROVINCES.	Muzaffarnagar .	—1·30	+2·61	—0·84	—0·17	—0·55	—2·86	—1·73	+5·42	+0·38	—0·36	—0·02	+0·80	+1·38
	Bijnor .	—1·32	+3·38	—0·88	—0·19	—0·28	—2·79	+0·34	—4·54	—2·03	—0·48	—0·05	+0·78	—8·06
	Meerut .	—1·12	+4·87	—0·67	—0·24	—0·40	—1·52	—5·44	—3·71	+4·92	—0·46	—0·05	+0·11	—3·71
	Moradabad .	—1·23	+2·97	—0·76	+0·71	—0·62	—3·68	—10·25	—1·44	—3·97	—0·74	+0·68	—0·21	—18·44
	Rudarpur .	—1·09	+2·87	—0·87	—0·03	+0·15	+2·61	—2·07	+9·29	—0·91	—1·09	+0·32	—0·01	+9·17
	Pilibhit .	—1·14	+4·55	—0·80	—0·16	+0·56	—1·98	+0·70	+6·29	—4·13	—1·21	+0·04	+0·33	+3·05
	Bulandshahr .	—0·85	+6·04	—0·44	—0·27	+0·17	—2·74	—3·10	+1·74	+3·04	—0·45	—0·08	+0·13	+3·19
	Bareilly .	—1·02	+3·36	—0·69	+0·33	—0·32	+0·55	—5·44	+3·21	—2·09	—1·26	+0·08	+0·41	—2·88
	Budaun .	—0·91	+3·37	—0·47	—0·14	—0·31	+0·62	—4·61	—0·82	+4·13	—0·45	—0·11	+0·20	+0·50
	Shahjahanpur .	—0·90	+4·62	—0·56	—0·05	—0·99	—2·90	—4·16	+2·80	—1·82	—1·23	—0·14	+0·24	—5·09
	Aligarh .	—0·81	+1·58	—0·39	—0·17	—0·11	—2·07	—3·38	+2·76	+0·13	—0·48	—0·04	+0·23	—2·75
	Muttra .	—0·57	+3·72	—0·25	—0·17	—0·19	—1·61	—6·25	+0·77	—1·43	—0·37	—0·06	—0·15	—6·56
	Agra .	—0·57	+2·40	—0·24	—0·15	—0·20	—2·53	—2·23	+3·02	—0·37	—0·41	—0·06	+0·44	—0·90
	Etah .	—0·57	+3·52	—0·50	—0·08	—0·39	—0·70	—1·04	—0·17	—2·67	—0·84	—0·05	+0·13	—3·36
	Mainpuri .	—0·71	+3·03	—0·29	—0·11	+0·08	—1·65	+0·20	+6·70	+0·36	—0·84	—0·11	+0·37	+7·03
	Farrukhabad .	—0·66	+3·47	—0·36	—0·09	—0·13	—1·30	—1·50	+3·65	+3·18	+0·64	—0·05	+0·12	+6·97
	Etawah .	—0·55	+2·53	—0·40	—0·12	+0·35	+0·05	+1·24	+12·65	—0·90	—0·97	—0·09	+0·40	—14·19
	Cawnpore .	—0·74	+0·98	—0·23	—0·13	—0·23	+2·81	—1·97	+7·89	—1·61	—1·16	—0·14	—0·06	+4·61
	Fatehpur .	—0·65	+2·38	—0·28	—0·13	—0·34	+5·87	—2·16	+17·95	—0·01	—1·59	+0·28	—0·15	+21·17
	Jalaun (Orai) .	—0·47	+1·35	—0·22	—0·05	—0·05	+3·30	—1·32	+3·45	+0·45	—0·57	+0·19	—0·03	+5·79

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inch.	Inch.	Inches.
NORTH-WESTERN PROVINCES—contd.	Hamirpur .	-0'53	+1'00	-0'23	-0'09	-0'23	+1'57	-4'37	+13'09	+7'73	-0'44	+0'01	-0'06	+17'45
	Banda .	-0'70	+0'55	-0'29	-0'11	-0'37	+5'24	+0'06	+14'43	-3'06	-1'49	+0'03	-0'22	+14'07
	Allahabad .	-0'76	+1'93	-0'41	-0'12	-0'22	-0'20	+2'48	+17'09	-1'67	-2'49	-0'03	-0'12	+15'48
	Basti .	-0'73	+1'58	-0'31	-0'23	+0'52	+4'53	+4'45	+2'96	+6'09	-2'16	-0'06	-0'04	+16'60
	Gorakhpur .	-0'73	+1'17	-0'36	+0'43	+0'69	-2'35	-2'67	+10'32	+10'30	-3'35	-0'18	-0'10	+13'17
	Azamgarh .	-0'57	+1'15	-0'36	-0'14	-0'10	+2'92	+3'36	+7'26	+11'30	-2'50	-0'07	-0'11	+22'14
	Jaunpur .	-0'68	+1'15	-0'30	-0'13	-0'73	-0'37	+7'69	+8'70	-0'22	-2'96	-0'16	-0'08	+11'91
	Benares .	-0'75	+1'61	-0'31	-0'13	-0'45	+3'05	+5'86	+0'56	+0'75	-2'11	-0'19	-0'01	+7'88
	Mirzapur .	-0'74	+2'22	-0'38	-0'13	-0'54	-1'52	+2'27	-0'94	+3'85	-2'21	-0'29	-0'15	+1'44
	Ballia .	-0'57	+1'03	-0'23	-0'24	-0'13	+2'61	+1'53	+5'59	+6'04	-3'51	-0'20	-0'12	+11'80
	Dudhi .	-0'63	+1'14	-0'40	-0'20	+0'08	-2'68	+0'12	+1'00	+1'97	-2'08	-0'31	0	-1'99
	Robertganj .	-0'72	+1'22	-0'45	-0'19	-0'64	-0'80	+0'89	+1'28	-0'12	-2'52	-0'42	-0'23	-2'70
	Jhansi .	-0'59	+1'64	-0'37	-0'05	+0'08	-1'90	+4'60	-0'83	-2'20	-0'72	+0'16	+0'51	+0'33
	Lalitpur .	-0'52	+0'98	-0'34	-0'13	-0'50	-1'37	+1'70	+1'69	-0'82	-1'00	-0'19	-0'33	-0'83
	Kheri .	-1'03	+2'30	-0'53	-0'02	-0'55	+1'16	+6'64	+9'43	-3'82	-1'22	+0'24	+0'13	+12'73
	Sitapur .	-0'85	+2'89	-0'50	+0'22	-0'97	-3'39	+1'38	+9'13	-0'40	-1'47	-0'17	+0'20	+6'07
	Bahraich .	+0'15	+1'71	-0'38	+0'07	-0'76	-2'23	-6'38	+3'75	-2'34	-1'84	+0'10	+0'06	-8'09
	Gonda .	-0'69	+3'28	-0'34	+1'88	-0'36	-4'96	+11'78	+6'60	-0'27	-1'67	+0'05	+0'01	+15'31
	Hardoi .	-0'67	+2'17	-0'63	+0'26	-0'28	-2'29	-3'28	+1'26	-0'34	-1'11	-0'13	+0'07	-4'97
	Nawabganj (Bara Banki)	-0'86	+1'53	-0'40	-0'17	+1'00	+1'20	+1'54	+14'31	+0'67	-1'20	-0'08	-0'13	+17'41
ODHA.	Lucknow .	-0'88	+3'70	-0'33	-0'07	+0'69	+2'34	-2'42	+2'44	-1'43	+2'32	-0'08	-0'24	+6'04
	Unao .	-0'82	+1'33	-0'31	-0'11	-0'56	-0'05	-1'11	+7'79	-0'08	-1'48	-0'07	-0'12	+4'41
	Fyzabad .	-0'72	+0'79	-0'46	-0'17	-0'14	+2'34	+6'17	+7'73	+2'01	-2'10	-0'04	-0'18	+15'23
	Sultanpur .	-0'60	+1'04	-0'20	-0'20	-0'04	-5'30	+4'27	+2'15	-3'74	-2'41	-0'10	-0'23	-5'36
	Rae Bareli .	-0'61	+1'37	-0'26	-0'08	-0'19	+7'50	+0'66	+18'99	-1'05	-1'47	+0'13	-0'11	+24'88
	Partabgarh .	-0'73	+1'39	-0'24	-0'04	-0'45	-1'79	+7'18	+4'40	-5'16	-2'49	-0'24	-0'28	+1'55
	Motihari .	-0'13	+1'12	-0'48	+0'31	+1'22	-1'96	-4'22	-0'45	+21'05	-2'89	-0'13	-0'11	+13'33
	Darbhanga .	-0'24	+0'10	-0'12	+0'67	+1'05	-1'49	-4'69	-3'06	+12'80	-1'10	-0'08	-0'12	+3'72
	Siwan .	-0'77	+1'04	-0'14	+0'31	-0'66	-0'63	-2'26	-3'18	+12'92	-3'28	-0'19	-0'11	+3'05
	Buxar .	-0'71	+1'42	-0'30	-0'15	-0'28	-1'14	-1'22	+6'57	+4'36	-2'84	-0'43	-0'14	+5'14
BENGAL.	Chapra .	-0'70	+0'29	-0'38	-0'31	-0'38	-1'24	+5'99	+5'34	+9'01	-2'14	-0'27	-0'07	+15'14
	Arrah .	-0'78	+1'26	-0'46	-0'46	-1'09	-0'44	+6'01	+3'31	+5'05	-1'62	-0'24	-0'07	+10'47
	Patna(Bankipore)	-0'68	+0'79	-0'28	-0'28	-0'32	-3'69	+3'24	+11'01	+9'61	-0'61	-0'22	-0'11	+18'46
	Muzaffarpur .	-0'72	-0'01	-0'41	+0'09	+1'83	-2'49	-0'67	+3'25	+14'70	-1'22	-0'13	-0'07	+14'15
	Barh .	-0'53	+0'45	-0'32	-0'15	-0'44	-1'33	+1'48	+9'42	+8'95	-1'96	-0'21	-0'09	+15'27
	Sasaram .	-0'49	+1'57	-0'35	-0'15	-1'01	-2'21	+10'88	+6'62	+4'72	-2'67	-0'31	-0'17	+16'43

TABLE XVII—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
PENGAL.—contd.	Gaya . . .	-0'66	+0'74	+0'19	-0'27	-1'12	-4'56	-3'01	+6'37	+ 6'24	-0'22	-0'29	-0'09	+ 3'32
	Jamui . . .	-0'67	+0'28	-0'39	-0'14	-0'63	-3'04	+0'42	+5'80	+10'59	-1'71	-0'10	0	+ 10'41
	Monghyr . . .	-0'43	+0'44	+0'03	+0'21	+2'30	-4'38	-4'35	+5'27	+13'16	-1'71	-0'21	-0'08	+ 10'25
	Bhagalpur . . .	-0'31	+0'32	+0'27	-0'22	+1'30	-3'48	-3'39	+13'08	+15'53	-2'96	-0'19	-0'08	+19'87
	Godda . . .	+0'09	+0'57	-0'51	+0'06	-2'08	-2'04	-5'35	+1'93	+ 7'86	-1'34	-0'29	-0'10	-1'20
	Palamau . . .	-0'68	+1'24	-0'65	-0'25	-1'08	-1'52	+0'52	-0'83	+ 0'41	-1'47	-0'40	-0'03	-4'74
	Hazaribagh . . .	-0'52	+0'21	-0'53	+0'17	-1'66	+4'55	-3'99	-0'67	+ 7'71	-1'32	-0'34	-0'06	+3'55
	Ranchi . . .	-0'67	-0'45	-1'42	0	-0'64	+3'58	+4'80	-1'23	+ 0'46	-0'51	-0'35	-0'02	+3'05
	Lohardaga . . .	-0'69	+0'59	-0'97	-0'15	-1'64	-1'08	+2'14	+2'74	- 0'68	-1'15	-0'60	+0'77	-0'72
	Naya Dumka . . .	-0'54	-0'50	-0'63	+0'15	-1'99	+2'13	+0'80	+3'89	+ 7'15	-2'74	-0'36	-0'18	+7'18
	Gobindpur . . .	-0'50	-0'65	-0'56	-0'58	-0'69	+1'68	-1'01	+2'68	+ 6'24	-1'64	-0'20	-0'16	+4'61
	Purulia . . .	-0'32	-0'73	-0'85	-0'37	+0'99	+15'23	+7'01	+5'37	+ 0'88	0	-0'27	-0'80	+26'74
	Sirgoja . . .	-0'87	+2'27	-0'86	-0'26	-0'08	+6'44	-1'81	-9'48	- 1'72	-1'26	-0'65	-0'37	-8'65
	Jushpore . . .	-0'72	+0'41	-1'65	+0'05	-1'17	-7'85	+1'54	-2'03	- 1'68	-0'88	-0'52	+0'19	-14'31
	Gangpur . . .	-0'36	+1'75	-0'97	-0'28	+0'92	-6'55	-3'27	-1'93	- 2'85	-1'08	-0'84	-0'02	-15'48
	Chaibassa . . .	-0'56	+0'33	-1'23	-0'23	-1'20	-0'63	-1'60	-1'49	+ 2'78	+0'55	-0'45	+0'10	-3'63
	Barreepudda . . .	-0'19	-0'51	-1'40	+1'08	-2'25	-5'82	-5'91	+0'67	- 1'10	+0'09	-0'99	+0'67	-15'66
	Keonjhar . . .	-0'17	-0'57	-0'55	-0'10	+1'15	-1'42	-0'33	+3'28	+ 0'91	+2'41	-0'97	+0'97	+4'61
	Jellasore . . .	-0'49	-0'19	-1'21	0	-1'65	-2'02	-9'47	+8'03	- 2'89	+3'48	-0'76	+0'74	-6'34
	Balasore . . .	-0'60	-1'23	-1'72	-0'90	-2'97	-3'86	-6'70	+0'79	- 2'14	+6'44	-1'29	-0'02	-14'20
	Bhadrak . . .	-0'35	-0'77	-1'47	-0'34	-0'08	+1'22	+0'61	+7'05	+ 0'13	+3'56	-1'40	+1'23	+9'39
	Talcher . . .	-0'21	-0'42	-1'26	+1'62	+3'82	-3'33	-3'76	-2'46	- 2'96	+2'58	-1'29	-0'10	-7'77
	Narsinghpur . . .	-0'23	+0'26	-0'81	+0'13	-0'01	+2'19	+4'45	+2'21	- 2'38	+0'05	-1'52	-0'07	+4'27
	Angul . . .	-0'21	-0'40	-1'35	+0'33	+2'40	-3'56	-3'65	-3'57	- 0'70	-0'25	-1'51	+0'46	-12'01
	Dhenkanal . . .	-0'30	-0'53	-1'30	+1'36	+2'39	-2'66	-7'30	-0'56	+ 4'46	+2'12	-1'34	+0'47	-3'19
	Bispara . . .	-0'32	+0'36	-0'82	+1'39	+3'19	-1'95	-2'14	+2'11	+ 5'17	-2'11	-1'16	-0'30	+3'42
	Kunjabangar . . .	-0'23	-0'09	-1'37	-1'30	-2'93	-2'20	+0'19	-5'63	- 2'12	-3'67	-1'37	-0'13	-20'85
	Banki(Charchika) . . .	-0'22	-0'49	-1'39	+1'44	+0'47	-2'63	+0'57	-1'33	- 4'26	+1'90	-1'75	-0'32	-8'01
	Cuttack . . .	-0'36	-0'52	-1'27	+0'58	-1'06	-4'70	-6'49	+2'70	-4'22	+2'04	-1'44	-0'38	-15'12
	False Point . . .	-0'55	-0'88	-1'02	+0'32	-3'56	-7'41	-2'38	+8'82	-5'27	+10'20	-2'96	-0'38	- 5'07
	Puri . . .	-0'27	-0'99	-0'60	+0'10	+0'33	-5'25	-0'35	-1'37	-4'30	+2'52	-2'21	-0'60	-12'99
	Darjeeling . . .	+0'01	+1'42	-1'57	+1'14	-1'52	-12'52	+12'25	-5'73	+20'86	-3'70	+0'52	+0'35	+ 9'53
	Pedong . . .	-0'90	+2'37	-2'17	+2'91	-5'01	-3'78	+10'26	+2'54	+6'57	+0'19	+0'78	+0'17	+13'93
	Buxa . . .	-1'10	+0'90	-2'81	+9'91	-11'59	-12'97	-3'11	-14'68	-4'21	-6'39	+0'82	+0'62	-44'61
	Jalpaiguri . . .	-0'52	+1'21	-1'45	-2'25	-2'94	+8'78	+2'70	-15'56	+14'29	-3'16	+0'08	-0'08	+ 1'10
	Cooch Behar . . .	-0'25	+0'56	-1'51	+0'74	-2'58	+7'16	-13'12	-9'67	+16'52	-3'42	+0'15	-0'07	- 5'49

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BENGAL—contd.	Kishanganj .	-0'13	+0'40	-0'57	+1'21	-0'01	-5'16	+1'73	-9'70	+17'96	-1'11	-0'05	-0'11	+4'46
	Parnea .	-0'33	+0'01	-0'11	-0'37	+0'62	-4'80	-5'88	-3'72	+21'05	-1'95	-0'07	-0'10	+4'35
	Rangpur .	-0'06	+1'26	-1'10	-1'50	-3'03	-1'37	+1'23	+2'70	+6'02	+0'90	-0'26	-0'09	+4'70
	Dinajpur .	+1'32	+1'34	-0'73	-1'09	-0'84	-1'18	-1'76	-0'35	+6'69	-2'32	-0'18	-0'08	+0'82
	Malda .	+0'03	+1'83	-0'79	+0'07	-0'48	-2'45	-6'44	+4'51	+7'58	-0'35	-0'22	-0'23	+3'06
	Bogra .	+0'55	+0'05	-0'88	-1'81	+0'58	+0'14	-4'80	+0'97	+1'44	+10'79	-0'91	+0'12	+6'24
	Rampur Boalia .	+0'44	-0'81	-1'13	-0'39	-0'12	+2'23	-4'96	+6'98	+3'97	+4'17	-0'34	-0'07	+9'97
	Pabna .	+0'07	-0'97	-1'51	-1'72	-1'14	-1'23	-3'39	-1'20	+2'05	-1'61	-0'66	-0'06	-11'37
	Suri .	-0'27	-0'89	-0'78	-0'15	-0'93	+5'40	+3'76	+8'38	+3'49	+0'54	-0'35	-0'13	+18'07
	Bankura .	-0'34	-0'93	-1'28	-1'22	-1'26	+16'33	-7'05	+2'74	+1'51	-1'49	-0'55	-0'14	+6'32
	Burdwan .	+0'33	-0'71	-1'32	-0'47	-4'87	+9'00	-3'95	+5'08	+5'11	-0'77	-0'71	-0'13	+6'59
	Hoogly .	-0'03	-0'75	-1'59	-1'92	+6'91	-2'08	-7'32	+2'34	-1'34	+2'59	-0'73	-0'20	-4'12
	Howrah .	-0'21	-1'22	-1'60	-0'80	-1'26	-2'36	+0'13	+4'97	-3'19	+2'37	-0'56	-0'20	-3'93
	Midnapore .	-0'54	-0'35	-1'43	-0'06	-3'34	+6'59	+1'62	+2'20	+2'10	+1'01	-0'63	-0'14	+7'03
	Tamluk .	-0'23	-1'09	-1'65	+0'28	-1'57	-1'61	+0'28	-1'61	+3'29	+4'62	-0'52	-0'20	-0'01
	Berhampore .	+0'02	-0'90	-1'08	+0'36	+2'13	+9'53	-2'31	+10'29	+2'12	+4'48	-0'44	-0'10	+24'10
	Krishnagar .	+1'66	-0'67	-1'16	-1'76	+1'86	+5'51	-1'46	+5'05	+1'93	+1'23	-0'81	-0'11	+11'27
	Faridpur .	+2'87	-1'35	-2'44	-2'63	+1'08	+0'21	-3'01	+5'99	-1'85	+10'62	-1'13	-0'09	+8'27
	Jessore .	+0'45	-0'85	-1'92	-3'29	+6'97	-4'83	+3'81	+8'86	+0'62	+0'19	-1'28	+0'12	+8'85
	Basirhat .	+0'20	-1'11	-1'72	-1'81	-2'22	-5'44	+0'42	+6'41	+0'31	+1'93	-0'58	-0'16	-3'77
	Khulna .	+0'13	-0'79	-1'92	-2'20	+2'29	+1'89	+10'28	+11'64	-2'96	+2'09	-0'83	-0'23	+19'39
	Barisal .	0	-0'81	-2'22	+1'64	+1'02	-6'08	-0'29	+9'90	-2'17	+2'48	-1'15	+0'93	+3'25
	Alipore (Obsy.)	+0'04	-1'11	-1'30	-0'44	-1'57	-1'74	+0'80	+5'18	-1'06	+2'78	-0'74	-0'37	+0'47
	Saugor Island .	-0'24	-1'06	-1'26	-0'35	-2'62	-3'10	+0'14	-2'00	-3'90	+11'57	-1'48	-0'22	-4'52
	Mymensingh .	+0'10	-1'03	-1'61	-2'63	-1'19	+3'46	-4'24	+9'62	-0'49	+7'68	-0'84	-0'06	+8'77
	Kishorganj .	+0'32	-0'82	-1'42	-4'11	-6'26	+5'70	-4'99	+5'89	-1'32	+5'99	-0'78	-0'18	-1'98
	Atia (Tangail) .	+0'51	-0'61	-1'44	+0'41	-1'35	-0'15	-3'61	+8'15	+1'21	+3'87	-0'55	-0'08	+6'36
	Dacca .	+0'98	-1'08	-2'54	-4'13	-0'77	-3'48	-0'85	+16'32	-1'84	+1'58	-0'92	-0'11	+3'16
	Comilla .	+0'72	-0'50	-2'64	-5'90	-0'51	-1'39	-6'74	+5'61	-3'62	+4'39	-1'31	-0'21	-12'10
	Agartalla .	+0'28	+3'27	-3'80	-4'69	-1'74	+5'49	-5'70	+4'39	-2'37	-2'44	-1'45	-0'34	-9'10
	Noakhali .	-0'34	-0'95	-2'86	-2'22	+0'69	+4'13	+7'64	+20'50	-0'26	+4'32	-1'76	-0'39	+28'50
	Demagiri .	+0'10	-1'30	-3'89	-4'79	-11'90	+19'66	-6'16	+0'23	-4'60	-2'42	-1'66	-0'74	-17'47
	Rangamati Hills	-0'40	-1'20	-3'34	-3'70	-7'84	+10'95	-9'12	+6'34	+2'74	-2'57	-1'68	-0'54	-10'36
	Chittagong .	-0'18	-1'10	+0'48	-3'67	-4'61	+8'31	-0'35	+13'64	-5'67	+0'48	-1'57	-0'62	+5'14
	Cox's Bazar .	-0'37	-0'41	-1'61	-2'24	-7'29	+3'15	-6'68	+12'06	-0'30	+2'59	-2'13	-0'33	-3'56

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
ASSAM.	Sylhet . . .	-0'11	-0'58	-5'87	-10'38	-16'38	-13'68	-14'16	+6'40	+3'72	-1'06	-1'23	-0'24	-33'57
	Silchar . . .	-0'37	-1'20	-6'96	-12'04	-16'24	-3'98	-8'85	+1'72	+0'48	-2'99	-1'32	-0'53	-46'28
	Cherra Poonjee	-0'09	-1'61	-10'08	+6'54	-6'93	-17'56	-47'93	+40'63	+26'71	+29'38	-1'69	-0'10	+17'27
	Tura . . .	-0'38	+1'40	-1'93	-0'97	-8'38	+4'32	-6'36	+2'08	+2'36	+9'70	-0'44	-0'03	+1'37
	Shillong . . .	+0'33	-0'61	-1'82	-0'08	-3'31	-2'47	-9'59	-1'13	-2'84	+5'24	-0'75	-0'04	-17'07
	Dhubri . . .	-0'30	+0'26	-1'73	-0'25	-2'22	+2'55	-4'99	-1'13	+4'27	+0'21	+0'04	-0'08	-3'37
	Goalpara . . .	-0'12	+0'89	-1'10	-0'62	+4'31	+0'75	-5'15	-4'70	-0'32	+1'26	+0'08	-0'01	-4'73
	Kulsi . . .	+0'47	-0'04	-2'04	-2'81	-3'42	-0'77	+3'04	+2'73	+1'66	+9'10	+0'84	-0'37	+8'39
	Gauhati . . .	+0'96	+0'57	-1'91	-1'44	-2'48	-2'04	+6'31	+0'66	-3'20	+7'85	-0'47	-0'22	+4'59
	Nowgong . . .	+0'30	+0'05	-2'24	-3'12	+1'39	-1'53	-4'34	-6'25	-2'93	+2'67	+1'19	-0'17	-14'98
	Tezpur . . .	+0'01	+0'53	-1'10	+1'82	-1'91	-6'99	+3'44	+6'94	-3'48	+3'98	-0'66	-0'02	+2'56
	Charduar . . .	+1'57	-0'36	-1'11	+4'76	-0'89	-1'64	+3'48	-3'40	-0'17	+0'66	-0'34	+0'57	+3'13
	Sibsagar . . .	-0'80	+0'15	-4'34	+0'42	-0'31	-2'19	+1'51	+0'86	-0'47	+0'30	-0'82	+0'64	-5'05
	Dibrugarh . . .	-1'24	+2'30	-3'70	+5'33	-1'67	+0'84	+0'75	+23'16	+7'87	-1'83	-1'11	+1'72	+32'42
	Kohima . . .	-0'23	+0'87	-1'68	-3'31	-3'04	-5'31	+5'50	+6'62	-3'78	+2'86	-1'16	-0'20	-2'86
	Saugor . . .	-0'68	+0'87	-0'20	-0'12	-0'56	+5'10	+8'92	+5'16	-2'51	-1'27	-0'36	-0'20	+14'15
	Damoh . . .	-0'57	+2'53	-0'07	-0'21	-0'32	+2'56	-1'52	+8'74	-0'77	-1'63	-0'34	-0'43	+7'97
	Jubbulpore . . .	-0'68	+2'86	-0'52	-0'11	-0'30	-4'01	+8'39	+6'39	+4'18	-1'48	-0'40	-0'26	+14'06
	Narsinghpur . . .	-0'42	+0'83	-0'29	-0'25	-0'40	-0'82	+6'52	-3'15	-3'73	-1'57	-0'27	-0'38	-3'93
	Hoshangabad . . .	-0'33	+0'29	-0'23	-0'04	-0'56	-2'24	+11'64	+7'89	-3'65	-1'44	-0'43	-0'47	+10'43
CENTRAL PROVINCES.	Khandwa . . .	-0'32	-0'13	-0'10	-0'13	-0'31	-2'68	-1'06	+2'12	-1'92	-1'18	-0'17	-0'42	-6'30
	Badnur (Betul) . . .	-0'46	+0'89	-0'61	-0'20	-0'50	+2'95	+0'82	+3'72	-3'74	-1'73	-0'42	-0'52	+0'20
	Pachmarhi . . .	-0'57	+0'77	-0'37	+0'67	-0'43	-3'26	-0'71	+6'52	-7'48	-1'89	-0'47	-0'58	-7'80
	Chhindwara . . .	-0'71	+0'89	-0'49	+0'37	-0'55	+0'27	+0'68	-1'43	-5'37	-1'96	-0'46	-0'36	-9'12
	Seoni . . .	-0'67	+3'62	-0'50	-0'14	-0'36	-0'93	+4'41	-2'98	+5'44	-1'18	-0'4	-0'57	+5'67
	Balaghat . . .	-0'53	+2'09	-0'41	-0'36	-0'70	-0'54	+0'82	+4'30	-2'07	-1'84	-0'55	-0'25	-0'04
	Mandla . . .	-0'56	+2'53	-0'80	-0'48	-0'49	-1'65	+1'45	+1'80	+0'59	-1'20	-0'31	-0'19	+0'69
	Bilaspur . . .	-0'51	+0'88	-0'76	-0'65	-0'10	-2'90	+1'84	-1'92	-2'92	-1'60	-0'64	-0'29	-9'57
	Sarangarh . . .	-0'19	+1'45	-0'72	-0'17	+0'03	-0'69	+3'25	-3'87	-2'34	+1'51	-0'79	-0'16	-2'69
	Raigarh . . .	-0'20	+0'39	-0'56	-0'11	-0'44	-4'86	-7'67	-13'61	-3'41	+1'08	-0'68	-0'23	-30'30
	Sambalpur . . .	-0'56	+0'33	-0'91	-0'25	-1'15	-7'62	+3'37	+1'42	-2'27	-1'33	-0'47	-0'21	-9'65
	Raipur . . .	-0'30	+1'47	-0'64	-0'56	-0'74	-3'84	+2'84	-3'19	-1'90	-0'85	-0'69	-0'22	-8'62
	Dhamtari . . .	-0'21	+1'10	-0'49	-0'11	-0'84	-2'93	+1'19	+0'08	-1'33	+2'53	-0'41	-0'13	-1'55
	Bhandara . . .	-0'86	+2'97	-0'63	-0'28	-0'46	+5'59	-0'04	-1'27	+0'55	-1'73	-0'77	+0'84	+3'91
	Nagpur . . .	-0'61	+2'25	-0'61	+0'91	-0'36	-2'27	+6'36	+3'24	+1'45	-2'14	-0'55	-0'38	+7'29
	Arvi . . .	-0'55	-0'06	-0'51	-0'04	-0'61	-2'79	-8'01	-6'54	-5'22	-2'51	-0'40	-0'42	-27'65

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCES.	Station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	T TAL.
		Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inch.	Inches.
CENTRAL PROV. INCES—contd.	Wardha .	-0'37	+2'14	-0'38	0	-0'43	+1'68	-0'82	-5'56	-3'66	-1'88	-0'63	-0'38	-10'29
	Brahmapuri .	-0'43	+5'63	-0'95	+1'36	-0'63	-1'78	-1'70	-4'79	+0'42	-2'20	-0'62	-0'41	-6'10
	Chanda .	-0'27	+4'92	-1'34	-0'48	-1'84	+4'85	+14'22	-6'29	-2'63	-2'05	-0'82	-0'33	+7'94
	Sironcha .	-0'30	+2'04	-0'67	+0'81	-0'95	-0'94	-0'49	-2'59	-4'86	+2'96	-0'05	-0'26	-5'30
	Baster (Jagadalpore.)	-0'11	+0'92	-0'91	-0'70	-0'20	+3'43	-1'51	-4'79	-3'53	-2'02	-0'96	-0'23	-10'61
	Chikalda .	-0'57	+0'23	-0'45	+0'21	-0'26	-3'23	-2'47	+2'33	-2'16	-2'64	-0'74	-0'87	-10'62
BERAR.	Ellichpur .	-0'43	+0'14	-0'34	+0'31	+0'21	+1'10	-0'09	+0'52	+0'27	-2'50	-0'62	-0'56	-1'99
	Amraoti .	-0'47	+0'37	-0'33	-0'20	-0'56	-1'13	-1'68	-3'94	-1'74	-1'87	-0'37	-0'49	-12'41
	Akola .	-0'49	-0'04	-0'46	+0'01	-0'15	-0'95	-0'19	-2'53	-3'14	-2'11	-0'32	-0'65	-11'02
	Buldana .	-0'57	-0'21	-0'27	-0'26	-0'53	-1'95	+0'21	-3'79	-1'00	-2'21	-0'53	-0'50	-11'61
	Basim .	-0'33	+0'42	+0'42	+0'15	+0'16	-5'01	-2'52	-3'82	-0'38	-2'03	-0'61	-0'50	-14'05
	Yeotmal .	-0'27	+1'48	-0'54	+0'34	-0'67	+0'61	-3'56	-4'44	-5'45	-2'54	-0'61	-0'43	-14'08
	Wun .	-0'33	+2'30	-0'95	-0'16	+0'10	+4'17	+8'80	-7'23	+1'31	-1'70	-0'66	-0'33	+5'32
	Dhulia .	-0'30	+0'19	-0'04	-0'06	-0'31	-1'73	+0'93	-0'46	+2'32	-1'78	-0'39	-0'35	-1'98
	Nasik .	-0'08	+0'86	-0'04	-0'09	-0'65	-2'57	+2'02	-0'08	+2'52	-3'69	-0'42	+0'18	-2'05
	Igatpuri .	-0'16	+0'45	-0'03	-0'07	-0'41	-3'86	+5'06	+0'18	+10'56	-2'82	+0'29	+0'09	+9'28
	Malegaon .	-0'22	-0'02	-0'04	-0'20	-0'74	-1'21	+0'22	-0'67	-3'18	-2'30	-0'03	-0'25	-8'64
	Ahmednagar .	-0'30	-0'13	-0'14	-0'27	-0'99	-2'14	-0'45	-3'29	+1'27	-3'04	-0'95	-0'34	-10'77
	Poona .	-0'20	+0'02	-0'14	+0'70	-1'48	-0'60	+1'03	-1'47	+3'85	-3'30	-0'45	-0'05	-2'09
	Lonavla .	-0'07	-0'05	-0'07	-0'07	-0'76	+10'92	+16'67	-5'95	+4'97	-3'75	-0'85	-0'18	+20'81
	Satara .	-0'30	+0'20	+0'15	+2'00	-0'66	+0'25	-2'76	-3'82	+1'12	-0'40	-1'38	-0'30	-5'90
POMBAY.	Mahabaleshvar	-0'34	+0'51	-0'29	+0'13	+0'45	+21'26	-2'11	+3'65	+9'23	-3'70	-0'89	-0'09	+27'81
	Sholapur .	-0'07	+0'24	-0'30	-0'48	-0'76	+2'05	+2'16	-2'73	+7'16	-0'97	-0'55	-0'30	+5'45
	Kolhapur .	-0'07	+0'70	+0'83	+2'04	+1'38	+0'31	+4'73	-2'10	+0'24	+0'58	-0'29	-0'16	+8'19
	Belgaum .	-0'07	+0'02	+1'26	+1'53	+1'59	+0'92	+1'75	-5'92	+5'51	-0'79	-0'22	+0'03	+5'61
	Gokak .	-0'08	+0'07	-0'20	+1'85	+0'91	-0'15	+0'87	-1'72	+0'93	+0'50	+0'92	-0'60	+3'30
	Dharwar .	-0'13	+0'41	+1'20	+0'84	+0'38	+1'69	+1'98	-3'38	+5'66	+0'27	+0'16	-0'28	+8'80
	Hubli .	-0'10	-0'02	+0'08	+2'63	+2'33	-0'13	+1'14	-2'32	+9'43	+0'25	+0'60	-0'08	+13'81
	Nargund .	-0'19	+0'21	-0'26	+0'98	-0'58	+0'45	+1'26	-1'54	+4'31	+2'12	+1'14	-0'29	+7'61
	Mundargi .	-0'22	0	-0'14	+0'50	-0'24	+2'95	+0'19	-1'37	+5'67	-3'32	+3'70	+0'15	+7'87
	Kalghatgi .	-0'09	+0'07	+0'29	+4'72	+2'15	+0'90	+1'27	-1'09	+4'77	+1'22	+2'09	-0'11	+16'19
	Bijapur .	-0'06	+0'30	-0'05	+0'81	-0'39	-0'18	-0'75	-2'39	+0'97	+2'16	+1'60	-0'63	+1'39
	Honavar .	-0'18	+0'30	-0'11	+0'94	-2'62	-1'69	-2'20	-5'89	+13'74	-1'22	+1'10	+0'04	+2'21
	Karwar .	-0'13	+0'40	-0'04	+0'02	-2'68	+5'86	+5'16	-2'46	+9'99	+2'45	+1'28	+0'06	+19'91
	Goa .	-0'18	+0'06	-0'02	+0'18	-0'81	+1'36	+6'19	-4'43	+7'21	+1'26	+1'68	-0'09	+12'41
	Vengurla .	-0'21	+0'74	-0'06	+1'33	-1'38	+0'66	+9'73	-9'18	+5'66	+2'18	+3'92	-0'17	+13'22

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inch.	Inches.	Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inch.	Inches.
BOMBAY—contd.	Ratnagiri .	—0'69	+0'44	—0'01	+0'29	—0'98	+13'89	+11'53	—8'95	+2'24	—1'55	—0'55	—0'07	+15'59
	Colaba (Obsy.) .	—0'13	+0'15	—0'01	—0'03	—0'43	+4'25	—2'61	—9'79	+9'39	—1'33	—0'37	—0'05	—0'36
	Byculla J. J.	—0'17	+0'71	—0'01	0	—0'43	+3'70	—3'17	—9'78	+11'76	—2'45	+0'01	—0'04	+0'13
	Hospital.													
	Thana .	—0'20	+0'35	—0'06	0	—0'38	+0'75	+11'08	—8'01	+5'86	—2'82	+1'65	—0'05	+8'17
	Matheran .	—0'09	+0'48	—0'01	—0'02	—0'74	+9'06	+2'24	—19'37	+2'51	—5'01	—0'75	—0'05	—11'75
	Surat .	—0'04	+1'66	0	—0'01	—0'16	+2'71	—4'18	—7'03	—2'22	—1'73	—0'04	0	—11'04
	Broach .	—0'05	+1'16	—0'02	—0'01	—0'13	+4'56	+9'00	—5'67	—0'57	—1'62	—0'16	+0'09	+6'58
	Kaira .	—0'03	+0'31	—0'02	—0'02	—0'31	+1'92	+0'60	—4'69	+2'71	—0'57	—0'35	+0'10	—0'35
	Bariya .	—0'05	+1'09	0	0	—0'26	—2'06	+7'37	+1'42	—3'13	—0'99	—0'19	+0'27	+3'47
	Godhra .	—0'04	+0'85	—0'01	—0'01	—0'35	—0'42	+7'63	—2'30	—3'56	—1'02	—0'16	+0'31	+0'92
	Dohad .	—0'07	+1'45	—0'01	—0'03	—0'50	—1'02	+3'60	+2'42	—0'25	—1'19	—0'19	+0'12	+4'33
	Ahmedabad .	—0'03	+0'68	—0'01	—0'02	—0'51	+3'13	+4'03	—5'22	+4'53	—0'62	—0'21	+0'46	+6'21
	Idar .	—0'05	+0'39	—0'03	—0'02	—0'45	—3'24	—1'58	—9'11	—3'59	—0'29	—0'25	+0'31	—17'91
	Deesa .	—0'16	+0'01	—0'09	—0'04	+0'70	—2'15	+3'12	—7'70	—1'22	—0'62	—0'15	+0'44	—7'86
	Wadhwan .	—0'05	+0'13	—0'04	—0'01	+0'10	+2'38	—2'08	—2'13	+2'88	—0'49	—0'53	+0'37	+0'53
	Palanpur .	—0'12	—0'09	—0'07	—0'01	+0'09	—2'05	—1'17	—10'10	—1'42	—0'49	—0'11	+0'82	—14'72
	Rajkot .	—0'05	+0'20	—0'01	—0'01	—0'15	—2'40	—6'55	—4'75	+2'40	—0'70	—0'27	+0'13	—12'16
	Songad .	—0'04	+0'17	—0'06	—0'04	—0'16	+4'38	—2'59	—1'85	+3'10	—1'75	—0'25	+0'05	+0'96
	Jetalsar .	—0'05	+0'17	0	0	+2'22	—6'79	—6'49	—2'47	+0'64	—1'07	+0'24	+0'17	—13'43
	Aurangabad .	—0'16	—0'11	—0'07	—0'15	—0'37	—3'21	+0'30	—3'73	+1'39	—2'21	—0'81	+0'20	—8'93
	(Cantt.)													
	Hingoli .	—0'39	+0'38	—0'29	+1'28	+0'59	—4'99	+4'13	—4'12	—2'11	—2'57	—0'98	—0'43	—9'50
	Parbhani .	—0'07	—0'06	—0'26	—0'28	—0'59	—2'53	+2'65	—6'25	—2'38	—2'71	—0'69	—0'27	—13'44
	Nanded .	—0'13	+0'59	—0'53	+0'12	—0'74	—3'21	+3'98	—7'72	—5'09	—1'82	—0'58	—0'63	—15'76
	Bid .	—0'12	—0'04	—0'24	—0'23	+1'83	—1'06	+2'18	—4'86	+1'71	—2'44	—0'70	—0'65	—4'62
HYDERABAD.	Mominabad .	—0'21	+0'16	—0'44	—0'25	—0'11	—0'80	+7'41	—7'09	+5'93	—2'27	—0'98	—0'97	+0'38
	Indur (Indur) .	—0'06	+1'29	—0'58	+0'44	—0'23	—2'01	+10'40	—4'21	+1'49	—2'05	—0'11	—0'39	+3'98
	Karrimnagar .	—0'23	+2'13	—0'36	+0'05	—0'58	—2'70	+7'11	—3'62	—4'07	—0'86	+1'47	—0'33	—1'99
	(Yelgandal).													
	Kandi (Medak.)	—0'06	+0'63	—0'54	+0'09	—0'45	—2'23	+5'14	—1'06	—0'29	—2'05	+0'03	—0'20	—0'99
	Shamshabad (Ib- rahimpatan.)	—0'07	+0'93	—0'58	+1'75	—1'15	—0'94	+3'16	—2'29	—3'36	—2'88	—0'90	—0'18	—6'51
	Sandanali (Ib- rahimpatan.)	—0'03	+1'69	—0'72	+0'33	—0'84	—1'05	+1'00	—4'25	—0'23	—2'17	—0'95	—0'08	—7'30
	Dharashev (Nal- durg).	—0'02	+0'39	—0'30	+0'88	—1'13	—3'31	+3'78	—6'01	+5'25	—2'98	—0'16	—0'41	—4'02
	Bidar (Bidar) .	—0'02	+1'40	—0'54	+0'46	+0'24	—3'95	+5'42	—6'69	—2'25	—2'65	—0'86	—0'62	—10'06
	Gulbarga (Gul- barga).	—0'09	+0'72	+0'08	—0'38	—1'01	+1'88	+2'40	—4'60	+3'91	—0'95	—0'17	—0'28	+1'51
	Bolarum .	—0'12	+1'54	—0'61	—0'11	—0'41	+0'87	+9'12	—3'02	—1'28	—2'86	—0'60	—0'35	+2'20
	Secunderabad .	—0'25	+0'69	—0'76	+0'51	—1'01	+0'87	+6'68	—2'48	—0'96	—2'75	—0'03	—0'23	+0'28
	Hyderabad (Re- sidency).	—0'11	+0'48	—0'60	+1'87	—0'87	—0'69	+3'40	—2'59	—3'72	—2'98	+1'85	—0'45	—4'41

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
HYDERABAD—contd.	Janawada (Hyderabad).	-0'08	+1'41	-0'86	+1'29	-1'07	-0'43	+7'44	-5'80	-1'25	-2'68	+1'18	-0'01	-0'86
	Bongir (Nalgonda).	-0'16	+0'21	-0'49	+0'44	-0'56	+2'19	+8'64	-2'13	-0'39	-1'69	-0'48	-0'13	+5'45
	Hanumkonda (Warangal).	-0'28	+0'48	-0'95	+1'89	-0'27	-0'77	+3'95	-4'69	-1'15	+1'93	+2'47	0	+2'61
	Sirpur Tandur (Sirpur Tandur).	-0'04	+3'07	-0'48	-0'20	+0'30	-1'50	+7'19	-6'61	-1'00	-2'37	-0'95	-0'76	-3'35
	Palmur (Mahabubnagar).	0	-0'16	-0'47	-0'02	+0'13	+0'70	+1'93	-5'43	+2'08	-3'50	+0'34	0	-4'40
	Raichur . . .	-0'03	+0'48	-0'31	-0'15	-0'58	-0'01	+2'48	-4'60	+6'69	-3'94	-0'82	-0'12	-0'91
	Raichur (Cantt).	0	+1'04	-0'45	+0'39	-0'11	+1'52	+2'14	-5'61	+3'25	-2'68	-1'02	-0'17	-1'70
	Rambha . . .	-0'20	-0'56	-0'97	-0'14	-1'34	+5'69	+5'27	+0'42	+0'15	+15'56	-2'23	-0'25	+21'40
	Gopalpur . . .	-0'15	-0'23	-0'74	0'36	-1'83	-0'89	-2'16	-4'77	-3'93	+4'68	-3'08	-0'86	-14'32
	Aska . . .	-0'23	-0'12	-1'42	-0'09	-1'34	+4'22	+2'12	-5'18	-3'36	-0'66	-2'25	-0'52	-8'83
	Vizianagram . . .	-0'13	+2'45	-0'91	-0'06	+0'36	-1'50	+2'23	-1'87	-1'47	-2'26	+2'18	-1'03	-2'01
	Bimlipatam . . .	-0'22	+2'52	-0'18	+0'23	+2'38	-0'02	+3'09	-0'41	-0'03	+0'24	+6'92	-1'00	+13'52
	Rayaghadda . . .	-0'14	-0'28	-1'12	-0'51	-0'42	-2'20	+0'11	-4'45	-2'96	-0'07	-1'61	-0'38	-14'03
	Nourangapur . . .	-0'14	-0'35	-0'46	-1'04	+0'59	-0'27	+5'92	-2'25	-5'46	-1'90	-0'85	-0'08	-6'29
	Gunipur . . .	-0'08	-0'63	-1'25	-1'20	+0'75	-2'01	-2'65	+0'53	-4'43	-0'59	-1'76	-0'33	-13'65
	Jeypore . . .	-0'07	+0'45	+0'05	+1'05	-1'87	-1'02	-6'26	-10'37	-3'35	-1'55	-1'39	-0'05	-24'38
	Koraput . . .	-0'10	+0'66	-0'43	-0'54	-0'45	-0'28	-6'76	-4'33	+2'69	-2'58	-1'21	-0'19	-13'52
	Malkanagiri . . .	-0'07	-0'14	-0'32	+4'52	+0'74	+10'93	-4'94	-7'79	-10'09	+0'26	-0'03	-0'05	-6'98
	Narsapatnam . . .	-0'26	+2'23	-0'98	-0'21	-1'97	+2'86	-1'45	-4'83	-2'50	-3'12	+1'44	-0'82	-9'61
	Vizagapatam . . .	-0'27	+1'93	-0'34	+0'08	-1'08	+4'14	+0'42	-4'63	+3'42	-1'46	+7'79	-1'58	+8'42
	Cocanada . . .	-0'18	+1'07	-0'26	-0'38	-1'53	+0'85	+5'32	+1'88	-0'74	-1'83	+10'05	-0'79	+13'46
	Rajahmundry . . .	-0'16	+0'77	-0'29	-0'87	+2'40	+1'81	+0'90	-0'60	+0'58	-2'24	+2'85	-0'17	+4'98
MADRAS.	Ellore . . .	-0'17	+1'29	-0'38	-0'52	-1'39	-1'11	+3'39	-5'86	-5'51	-3'62	+0'86	-0'32	-13'34
	Masulipatam . . .	-0'20	+1'62	-0'27	-0'20	-1'03	+2'36	+1'84	+3'65	-1'50	-4'82	+7'85	-0'59	+8'71
	Guntur . . .	-0'26	+1'45	-0'49	-0'17	-1'33	-0'40	+0'56	-2'92	-1'02	+1'85	+0'33	-0'41	-2'81
	Vinukonda . . .	-0'21	+0'05	-0'51	-0'30	+0'98	+0'03	+1'73	-1'53	+1'88	-2'89	-0'28	-0'59	-1'64
	Ongole . . .	-0'22	+0'57	-0'24	-0'29	-0'02	+0'60	-0'39	-3'03	-1'71	+1'68	+4'69	-1'01	+0'63
	Nellore . . .	-0'42	+0'12	-0'20	-0'10	-0'56	-0'69	-1'06	-1'45	+4'60	+1'13	+2'69	-3'18	+0'88
	Udayagiri . . .	-0'35	-0'14	-0'49	+3'31	-0'33	-1'10	+0'46	-1'80	+2'63	-1'20	+1'58	-2'09	+0'48
	Tada . . .	-0'57	-0'48	-0'21	-0'14	-0'86	+0'87	-0'99	-1'27	+5'58	+2'62	+8'27	+6'11	+18'93
	Kurnool . . .	-0'05	0	+0'62	+0'15	-1'29	+1'13	+2'26	-4'02	+8'03	-3'50	-0'53	-0'16	+2'64
	Nandyal . . .	-0'08	+0'17	-0'17	+0'35	-0'91	+1'46	-1'10	-4'60	+7'93	-3'47	+0'45	-0'20	-0'17
	Bellary . . .	-0'11	-0'03	-0'46	+0'97	+0'12	-0'54	-0'56	-1'41	+1'69	-0'43	+0'54	-0'22	-0'44
	Gooty . . .	-0'04	+0'18	-0'08	-0'28	-0'22	-0'89	-1'81	-3'16	-0'18	-3'55	-0'10	-0'12	-10'25
	Adoni . . .	-0'04	0	-0'20	+0'28	-0'38	-1'67	+0'49	-3'28	+1'15	-3'38	+0'37	-0'17	-6'83
	Dharmavaram . . .	-0'01	-0'11	-0'18	+0'53	-0'58	-1'67	-1'70	-2'51	+3'64	-3'60	+0'41	+0'45	-5'33
	Cuudapah . . .	-0'16	0	-0'19	+4'27	-0'53	-1'82	-2'62	-3'54	+1'98	-2'74	+1'79	+1'71	-1'85

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years.—contd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	YEAR.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
MADRAS—contd.	Madanapalle .	—0'13	—0'14	—0'35	+0'33	—0'48	—1'54	+0'93	+0'90	+4'32	—5'68	+3'34	—0'25	+1'25
	Chittoor .	—0'29	+0'23	—0'34	—0'36	—1'92	—1'37	—1'83	—0'88	+2'87	—2'47	+12'52	—0'19	+5'17
	Vellore .	—0'51	—0'33	—0'18	+0'99	+1'38	—2'47	—0'65	+1'74	+4'13	—2'29	+10'96	+1'60	+14'39
	Chandragiri .	—0'20	—0'01	—0'24	+1'16	+1'00	—0'83	—1'76	+2'66	+3'37	—2'45	+3'75	+0'28	+6'73
	Arcot .	—0'37	—0'45	—0'33	—0'31	+1'19	—0'55	—1'16	+0'23	+4'18	—0'92	+10'96	+1'91	+14'38
	Madras .	—0'86	+0'21	—0'39	—0'61	—1'38	+0'02	—0'46	+2'50	+3'50	+5'47	+6'24	+4'74	+18'98
	Palmaner .	—0'16	—0'15	—0'40	0	+1'82	—1'75	—1'48	—0'22	+0'36	—2'16	+8'92	+0'85	+5'63
	Saidapet .	—0'55	—0'19	—0'32	—0'23	—0'62	—0'13	—0'98	+0'05	+1'14	+11'90	+3'94	+3'38	+17'39
	Chingleput .	—0'44	—0'31	—0'13	—0'20	—1'50	—1'08	—1'25	—1'63	+4'21	+15'43	+7'22	+5'20	+25'52
	Conjeeveram .	—0'44	—0'30	—0'12	—0'56	+0'42	—0'62	—1'04	+1'87	—0'27	+5'60	+6'27	+2'76	+11'57
	Tindivanam .	—0'43	+0'39	—0'27	—0'53	—0'78	—0'49	+0'08	+2'96	+7'32	—1'46	+14'72	+5'01	+26'52
	Cuddalore .	—0'88	—0'05	—0'38	—0'71	—1'46	+2'90	—0'14	—0'26	+4'21	+1'68	+18'42	+7'10	+30'43
	Vriddhachalam	—0'31	0	—0'30	—0'40	+1'01	+0'18	+0'98	+3'36	+11'25	—1'48	+16'23	+6'09	+36'61
	Udayarpalaiyam	—0'25	—0'32	—0'34	—0'53	—1'68	—1'63	+0'51	—0'95	+2'18	+2'28	+10'01	+11'00	+20'28
	Salem .	—0'26	+0'10	—0'87	+3'11	+0'20	—2'37	—2'53	+2'91	+2'63	—3'14	+8'84	+0'81	+9'43
	Atur .	—0'29	+0'19	—0'77	+0'54	—2'34	—0'94	—2'17	+2'22	+3'54	—0'20	+13'21	+3'27	+16'26
	Shevaroy Hills	—0'19	+0'82	—0'84	+1'15	—2'14	—2'68	—5'43	—4'19	+7'77	—1'34	+17'77	+0'71	+11'41
	Kumbakonam .	+0'04	—0'47	—0'52	+0'82	—1'74	—1'62	—1'39	+3'05	+0'34	—2'47	+11'74	+9'55	+17'33
	Tirupatur .	—0'15	—0'33	—0'50	—0'25	—2'34	—1'55	—2'96	—3'04	+5'77	+5'47	+5'69	+2'59	+8'40
	Hosur .	—0'20	+1'34	—0'49	+4'30	—0'54	—1'69	—1'94	—2'11	—0'11	—3'50	+6'15	+0'51	+1'72
	Tranquebar .	+0'16	—0'43	—0'13	—0'93	—0'44	—0'38	—0'37	+1'00	+1'76	+6'46	+6'78	+0'62	+14'10
	Negapatam .	+0'53	—0'36	—0'35	—0'85	—1'47	+1'25	—0'81	+0'92	+1'12	+2'70	+12'73	+6'54	+21'95
	Tanjore .	—0'14	—0'33	—0'46	+2'05	+0'47	—0'98	—1'34	+0'60	+5'86	—1'46	+9'61	+8'35	+22'23
	Pattukkottai .	—0'38	+1'58	—0'58	—0'92	+3'02	—1'52	—0'69	—3'41	+2'64	+1'77	+3'30	+3'14	+7'15
	Trichinopoly .	—0'14	—0'57	—0'62	+1'61	—0'94	—1'32	—1'63	—0'34	—1'62	—2'92	+3'11	+3'96	—1'42
	Karur .	—0'17	+0'75	—0'33	—1'40	—1'44	—1'54	—1'17	—1'87	+6'92	+4'11	+1'96	+0'97	+6'79
	Coimbatore .	—0'18	+0'37	—0'43	—0'94	—0'16	—1'00	—0'77	—0'80	+1'28	+3'43	+2'44	—0'11	+3'13
	Kollegal .	—0'14	—0'02	—0'93	+1'50	—0'12	—1'41	—1'43	—0'35	+9'39	—3'90	+4'11	+0'03	+6'73
	Dindigul .	—0'10	—0'33	—0'57	+0'93	—0'34	+0'80	—1'55	+2'29	+5'23	—1'62	+1'06	+2'68	+8'48
	Madura (Obsy.)	—0'45	+1'24	—0'68	+0'02	+1'52	—1'51	+0'23	—1'74	+7'10	+3'26	+2'85	+0'10	+11'94
	Vattanam .	+1'39	—0'75	—0'85	—1'87	—0'26	+0'87	+0'16	—1'88	+0'53	+8'57	+4'73	+2'20	+12'84
	Periyakulam .	—0'23	+2'87	—1'85	—1'65	+1'46	—1'07	—0'51	—1'27	+3'49	+1'86	—1'63	+2'08	+3'55
	Tinnevely .	+1'34	+1'63	—1'57	+0'75	—0'21	+0'50	—0'29	+0'46	—0'74	+2'84	—3'57	+0'58	+1'72
	Tuticorin .	+0'61	—0'55	—0'50	+0'59	—0'90	—0'20	—0'18	—0'27	+0'04	+4'08	—2'86	+1'98	+1'84
	Satur .	+0'28	—0'10	—1'10	—0'28	—0'22	—0'65	—1'01	—0'81	+2'32	—0'82	+3'52	+0'47	+1'60
	Cochin .	—0'78	+0'63	—2'10	—0'79	+1'27	+0'21	+2'44	—3'18	+2'74	+8'15	+5'62	—1'55	+12'66
	Palghat .	—0'06	+0'20	—0'84	+2'44	—2'91	—0'63	+1'40	—8'49	—1'42	—0'77	—0'38	—0'28	—11'74

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—contd.

PROVINCE.	STATION.	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
MADRAS—contd.	Wellington .	—0'15	—0'04	—2'48	+0'82	—0'43	—2'54	+0'33	—0'08	+5'45	+1'54	+0'39	—1'54	+1'72
	Manantoddy .	—0'20	—0'25	—1'21	—0'03	—0'92	+0'13	+2'58	—7'58	+4'13	+2'24	+0'48	—0'09	—0'72
	Calicut .	—0'18	—0'18	+0'03	—1'69	—2'45	—2'61	+7'60	—10'49	—0'26	+3'18	+4'34	—0'62	—3'33
	Tellicherry .	—0'30	—0'10	—0'43	—1'51	—1'67	—9'29	—6'49	—12'80	—1'17	—0'57	+1'38	—0'70	—33'65
	Cannanore .	—0'36	—0'22	+0'70	+2'62	+0'03	—3'05	+1'62	—10'44	+1'05	+0'02	+2'94	—0'49	—5'58
MYSORE AND COORG.	Mangalore .	—0'14	—0'06	—0'12	—1'60	—2'25	—0'80	—2'25	—10'84	+9'78	—0'39	+2'11	—0'52	—7'08
	Bangalore .	—0'19	—0'13	—0'56	—0'76	—2'31	—1'19	—1'45	—3'64	+5'79	—2'65	+3'54	—0'18	—3'73
	Mysore .	—0'08	+0'15	—0'68	—0'67	—2'53	—1'57	—0'20	—0'13	+7'35	—1'21	+8'21	—0'09	+8'55
	Shimoga .	—0'06	0	—0'36	—0'01	—1'17	+1'92	+3'34	—1'80	+7'99	+2'56	+3'35	—0'37	+15'39
	Mercara .	—0'21	—0'06	—0'68	+0'27	—2'93	+1'94	—3'13	—4'61	+4'87	—0'73	+1'18	—0'14	—4'23
	Kolar .	—0'18	—0'04	—0'57	+1'61	—0'60	—0'61	—1'45	—0'28	+1'87	—3'20	+12'10	—0'87	+7'78
	Tumkur .	—0'16	—0'20	—0'36	+1'71	—1'41	+2'67	—1'23	—1'90	+13'60	—3'20	+7'37	—0'39	+16'50
	Chitaldroog .	—0'19	—0'03	—0'29	—0'72	+1'28	—1'31	—0'06	—2'08	+6'85	—1'18	+4'73	—0'04	+6'96
	Chikmagalur .	—0'22	—0'18	—0'72	—1'25	—2'05	—0'31	—1'71	—2'27	+1'95	+6'27	+0'88	—0'13	+0'26
	Hassan .	—0'70	+0'06	—0'51	+0'89	+0'43	—1'10	—2'11	—2'43	+4'70	+5'49	+3'60	+0'10	+8'45
	Trincomalee .	+7'27	—2'18	—1'51	+3'62	—1'72	—1'60	+1'18	—1'40	+1'25	—2'16	—8'90	+14'98	+8'83
	Colombo .	—0'78	+0'01	—0'75	+11'55	—6'56	+2'77	+1'69	—2'61	+2'04	+5'96	—0'73	+2'60	+15'19
	Ratnapura .	—0'88	+5'87	—2'93	+1'46	+1'56	—7'50	+3'85	—7'04	+5'86	+6'89	+1'70	—2'27	+6'57
	Puttalam .	+0'21	—0'16	—0'52	—3'23	+2'70	—1'33	—0'44	—0'72	—0'01	+3'83	+9'50	+2'12	+11'95
	Anuradhapura .	+7'46	+0'06	—1'76	—3'53	+2'65	—1'53	+0'01	—1'36	—0'57	+9'74	+0'17	+1'01	+12'25
	Mannar .	+1'57	—1'00	—1'38	—1'94	—0'32	—0'63	—0'25	—0'53	+0'30	+1'59	+4'97	—3'09	—0'71
	Jaffna .	+1'92	—0'19	—0'15	—1'97	—1'76	+0'02	—0'71	+3'02	+4'06	+5'37	+10'57	+0'04	+20'22
CEYLON.	Batticaloa .	+3'56	—3'13	—2'38	—0'16	—0'50	—1'13	—0'84	—1'59	+4'61	+5'40	+0'59	+39'72	+44'15
	Hambantota .	+1'68	—1'69	—1'43	—1'42	—0'95	—1'60	—0'33	—1'25	—0'74	+4'25	+1'42	+4'52	+2'46
	Galle .	+0'10	—2'47	—2'64	—4'26	—5'69	—0'94	+5'38	—3'11	—3'17	+0'91	—1'52	—1'02	—18'43
	Kandy .	—0'90	—1'84	+0'23	—2'34	—2'68	—1'76	+0'13	—4'70	+4'06	+5'48	—4'05	—3'49	—11'86
	Nuwara Eliya .	+0'72	—2'05	—0'63	+0'36	—4'34	—5'57	—1'92	—6'98	+1'53	+3'19	—1'92	—2'94	—20'55
	Hakgala .	+2'27	—2'23	+1'04	+3'29	—2'19	—2'59	—1'44	—4'43	+1'49	+5'03	—1'44	—0'35	—1'55
	Badulla .	—2'77	—3'20	—0'61	—0'79	+2'09	?	—1'12	—2'22	+0'56	+0'30	—3'51	—5'31	?
	Vavuniya .	+5'13	—0'90	—0'68	+0'24	+0'74	—1'26	+0'26	?	?	?	?	?	?
	Kurunegala .	+0'82	—0'78	—0'79	—6'02	—0'91	—2'38	+1'52	—3'31	+5'03	—2'49	—3'41	—3'15	—15'87
	Akyab .	—0'14	—0'14	—0'46	—1'51	—7'95	+3'65	+11'07	+10'38	—5'88	—4'56	—3'38	—0'48	+0'60
BURMA.	Kyaukppeu .	—0'06	—0'05	—0'23	—1'00	—6'05	+2'87	+5'92	+8'73	—5'62	—6'95	—3'39	—0'54	—6'39
	Sandoway .	—0'08	—0'05	—0'11	—1'11	—0'67	+0'57	—6'74	+24'52	—4'71	—2'61	—2'62	—0'31	+6'08
	Rangoon .	—0'07	—0'27	—0'18	+1'81	+10'90	—2'93	+0'29	+12'15	—4'13	—4'05	—2'75	—0'07	+10'70
	Bassein .	+0'27	—0'23	—0'05	—1'45	+1'77	+11'61	—1'57	+8'90	+2'88	—0'19	—3'38	—0'11	+18'45

TABLE XVII.—Comparison of the monthly and total rainfall in 1898 with the averages of past years—concl'd.

PROVINCE.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BURMA—concl'd.	Diamond Island	+1.18	-0.08	-0.01	-1.34	+6.02	-0.69	-6.21	+0.94	-4.52	-5.77	-5.95	-0.82	-17.25
	Henzada . .	-0.01	-0.21	-0.04	-0.09	-0.68	-1.54	+0.25	-2.22	+2.88	-0.51	-1.79	-0.07	-4.03
	Myanaung . .	-0.06	-0.03	-0.01	-0.91	+1.81	-2.31	+0.24	-2.70	+1.21	-1.68	-2.09	-0.12	-6.65
	Prome . . .	+0.02	-0.01	-0.02	-0.40	+2.28	-3.85	+3.00	-3.57	-2.29	-3.13	-1.94	-0.08	-9.99
	Thayetmyo . .	+0.30	-0.03	-0.07	-0.61	+0.01	-3.85	-0.32	-1.65	-2.13	-2.42	-1.85	-0.13	-12.75
	Mandalay . .	-0.04	-0.07	-0.21	-0.85	-1.54	-4.21	-1.99	+3.59	-1.36	-1.72	-1.28	-0.28	-9.96
	Saweybo . . .	-0.09	-0.08	-0.28	-0.84	-0.33	-1.27	-1.82	-2.63	+0.17	+0.05	-1.13	-0.19	-8.44
	Ye-u	-0.10	-0.09	-0.48	-0.99	+0.74	-2.26	-2.93	-0.18	+3.15	-0.05	-0.71	-0.28	-4.18
	Minbu	-0.05	-0.02	0	-0.47	-0.51	+2.34	+3.06	-2.70	-2.41	+0.43	-1.18	-0.41	-1.72
	Pyinmana . .	+0.10	-0.09	-0.02	-0.04	+1.23	-0.43	+1.83	+4.91	-1.14	-2.52	-1.79	-0.11	+1.93
	Pagan	-0.04	-0.05	-0.16	-0.72	-0.03	-2.02	-0.22	+1.05	-1.94	+1.83	-1.03	-0.16	-3.49
	Kyauksai . .	+0.34	-0.04	-0.15	+1.75	-0.70	-3.65	+0.42	+1.54	+0.11	+0.86	-1.45	-0.31	-1.28
	Bhamo	-0.53	-0.01	-0.79	-1.29	-1.10	-1.91	-0.49	+4.01	+3.52	-1.46	-0.87	-0.39	-1.31
	Kindat	-0.18	-0.33	-1.25	-1.57	-0.94	-8.34	-2.51	+6.87	+0.90	+0.63	-1.71	-0.49	-8.92
	Magwe	0	-0.04	0	+0.90	-1.26	+0.42	+1.38	-1.11	-0.46	-0.17	-0.95	-0.58	-1.87
	Yamethin . .	+0.46	-0.13	-0.11	+1.23	+2.94	+3.55	-0.84	+2.18	+1.11	-1.73	-1.11	-0.46	+7.09
	Fort Sagaing .	-0.04	-0.06	-0.24	+1.38	+1.76	-1.33	-3.16	+5.24	-0.28	-1.45	-1.63	-0.17	+0.02
	Mingin	-0.14	-0.04	-0.55	-0.89	+0.01	+4.03	-1.88	-1.68	+4.03	+2.98	-1.62	-0.23	+4.02
	Toungoo . . .	-0.07	-0.13	-0.04	+0.76	+2.05	+2.60	-0.63	+2.59	-3.09	-5.26	-1.31	-0.17	-2.70
	Shwegyin . .	+0.27	-0.39	-0.28	-1.55	+7.65	+5.51	+3.06	+7.48	-0.03	-3.76	-1.83	-0.08	+16.05
	Moulmein . .	-0.18	-0.14	-0.25	-2.16	+15.86	-4.39	-8.10	+26.98	-6.19	-1.98	-1.19	-0.02	+18.24
	Tavoy	-0.16	-0.14	-0.92	-0.76	+6.13	+8.99	-7.14	+12.28	-10.78	-7.88	-0.82	-0.11	-1.31
	Mergue	-0.19	+0.49	-2.54	+1.23	+1.50	+0.11	-2.35	+1.94	-6.16	-5.36	-1.21	-0.45	-13.00
	Myingyan . .	-0.06	-0.07	-0.10	-0.44	+1.79	+1.95	+0.66	+8.32	+0.16	-0.15	-1.15	-0.16	+10.75
	Monywa . . .	0	-0.01	-0.37	-0.85	+0.98	+0.65	-1.98	-0.65	+0.62	+2.04	-1.09	-0.22	-0.88
BAY ISLANDS.	Port Blair . .	+4.13	-1.08	-0.37	+2.30	+24.32	-1.87	+10.03	-28.1	-6.69	-5.17	-5.75	-5.32	+11.72
	Cocos Island .	+0.84	-0.10	-0.01	-1.02	+5.38	+6.13	+0.06	-5.67	-3.19	-3.89	-3.92	-1.30	-6.69
KASHMIR .	Leh	-0.24	+0.05	-0.24	-0.06	-0.06	-0.22	-0.08	-0.20	-0.19	-0.20	-0.10	+0.96	-0.58
NEPAL .	Katmandu . .	-0.80	+0.91	-0.85	+0.97	+0.27	-1.49	+2.77	-0.86	+6.35	-1.24	-0.18	+0.34	+6.19
EXTRA INDIAN STATIONS	Bushire . . .	-2.06	-2.51	+3.82	-0.58	2	8	0	0	0	-0.10	+0.49	-1.81	+2.77
	Muscat	-1.46	-0.77	+0.46	-0.03	0	+2.10	-0.05	0	0	-0.03	-0.17	-0.21	-0.16
	Aden	-0.20	-0.09	-0.93	-0.31	-0.09	-0.05	-0.01	-0.16	-0.07	-0.01	-0.15	-0.08	-1.99
	Perim	-0.39	-0.14	+1.23	-0.02	-0.11	0	+0.14	+0.03	+0.08	-0.07	+0.07	-0.08	+0.74
	Zanzibar . . .	-1.42	-2.64	+0.95	-10.06	-5.38	-0.35	+0.53	-1.74	+0.02	-2.41	-0.50	-4.74	-27.74
	Port Victoria (Seychelles).	+4.55	+3.15	+1.75	-2.03	+2.23	-3.71	-1.81	-0.58	+1.20	-0.06	-6.16	-1.48	-2.95
	Baghdad . . .	-0.34	-1.27	-0.75	-0.88	+0.25	-0.01	0	-0.13	0	-0.04	-0.33	-0.82	-4.32

TABLE XVIII.—*Geographical summary of rainfall anomalies in 1898.*

METEOROLOGICAL DIVISION.	Area, square miles.	Number of stations.	Normal rainfall.	Actual rainfall, 1898.	Mean excess or defect.	Total excess square miles × 1 inch.	Total defect square miles × 1 inch.
			Inches.	Inches.	Inches.		
I. Punjab Plains	120,000	29	21'52	18'67	— 2'85	...	342,000
II. North-Western Provinces and Oudh .	83,500	44	37'49	43'35	+ 5'86	489,310	...
III. Rajputana	67,000	19	28'42	19'28	— 9'14	...	612,380
IV. Central India States	91,000	20	42'01	46'36	+ 4'35	395,850	...
V. Bihar	30,000	15	45'01	54'92	+ 9'91	297,300	...
VI. Western Bengal	38,000	10	49'39	55'19	+ 5'80	220,400	...
VII. Lower Bengal	54,000	28	66'64	70'38	+ 3'74	201,960	...
VIII. Assam and Cachar	61,000	16	96'39	89'80	— 6'59	...	401,990
IX. Orissa and Northern Circars	27,000	16	48'00	47'85	— 0'15	...	4,050
X. Central Provinces, South	61,000	17	51'38	48'49	— 2'89	...	176,290
XI. Berar and Khandesh	43,000	13	35'96	28'60	— 7'36	...	316,480
XII. Gujarat	54,500	13	33'03	29'30	— 3'73	...	203,285
XIII. Sind and Cutch	68,000	10	8'49	5'44	— 3'05	...	207,400
XIV. North Deccan	48,000	13	30'54	35'40	+ 4'86	233,280	...
XV. Konkan and Ghâts	16,000	11	138'92	150'62	+ 11'70	187,200	...
XVI. Malabar and Ghâts	18,000	8	113'89	107'79	— 6'10	...	109,800
XVII. Hyderabad	74,000	15	32'71	30'57	— 2'14	...	158,360
XVIII. Mysore and Bellary	58,000	18	29'52	31'93	+ 2'41	139,780	...
XIX. Carnatic	72,000	37	36'06	47'65	+ 11'59	834,480	...
XX. Arakan	11,000	7	148'04	142'15	— 5'89	...	64,790
XXI. Pegu	32,500	7	71'95	71'25	— 0'70	...	22,750
XXII. Tenasserim	10,500	4	172'38	178'30	+ 5'92	62,160	...
XXIII. Upper Burma	?	13	38'73	37'81	— 0'92	...	...

On the mean of the whole area represented in the above table there was an excess of 0'39 inch or excluding the Burmese Peninsula, of 0'43 inch.

TABLE XIX.—*Geographical Summary of the distribution of rainfall in 1898, according to seasons.*

METEOROLOGICAL DIVISION.	JANUARY AND FEBRUARY.			MARCH TO MAY.			JUNE TO OCTOBER.			NOVEMBER AND DECEMBER.		
	Normal average.	Actual average 1898.	Difference	Normal average.	Actual average, 1898.	Difference.	Normal average.	Actual average, 1898.	Difference.	Normal average.	Actual average, 1898.	Difference.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
North-West Himalayas	6'43	6'47	+0'04	7'21	3'27	-3'94	41'54	44'69	+3'15	1'74	3'49	+1'75
Punjab Plains	2'24	3'64	+1'40	2'75	1'17	-1'58	16'22	13'06	-3'16	0'75	0'80	+0'05
North-Western Provinces and Oudh	1'48	3'07	+1'59	1'41	0'71	-0'70	35'69	40'87	+5'18	0'45	0'61	+0'16
Rajputana	0'55	0'86	+0'31	0'76	0'69	-0'07	21'59	14'19	-7'40	0'39	0'61	+0'22
Central India States	0'97	1'72	+0'75	0'80	0'14	-0'66	41'76	45'57	+3'81	0'73	0'23	-0'50
Bihar	1'19	1'34	+0'15	2'51	2'26	-0'25	40'34	51'45	+11'11	0'34	0'03	-0'31
Western Bengal and Chota Nagpur	1'38	1'32	-0'06	3'59	2'02	-1'57	47'13	50'22	+3'09	0'65	0'23	-0'42
Lower Bengal	1'41	1'12	-0'29	10'64	7'87	-2'77	52'25	60'44	+8'19	0'79	0'07	-0'72
Eastern Himalayas	1'65	2'39	+0'74	18'38	13'82	-4'56	104'53	105'04	+0'51	0'50	1'08	+0'58
Assam and Eastern Bengal	1'83	2'23	+0'40	22'77	14'98	-7'79	69'30	72'13	+2'83	1'27	0'65	-0'62
Orissa and Northern Circars	0'74	0'71	-0'03	4'75	3'72	-1'03	44'68	40'84	-3'84	2'42	2'26	-0'16
Central Provinces, South	0'86	2'33	+1'47	1'84	0'64	-1'20	49'58	44'96	-4'62	0'90	0'11	-0'79
Berar and Khandesh	0'53	0'64	+0'11	1'13	0'71	-0'42	33'56	26'98	-6'58	1'19	0'25	-0'94
Gujarat	0'18	0'70	+0'52	0'37	0'33	-0'04	32'72	28'27	-4'45	0'35	0'42	+0'07
Sind and Cutch	0'53	0'27	-0'26	0'46	0'14	-0'32	8'22	5'87	-2'35	0'22	0'11	-0'11
North Deccan	0'19	0'21	+0'02	3'36	5'21	+1'85	25'71	28'16	+2'45	1'55	1'81	+0'26
Konkan and Ghâts	0'23	0'40	+0'17	1'71	0'94	-0'77	132'38	142'17	+9'89	0'97	1'46	+0'49
Malabar and Ghâts	0'50	0'22	-0'28	11'39	9'28	-2'11	98'53	92'55	-5'98	4'09	5'74	+1'65
Hyderabad	0'27	1'02	+0'75	1'95	1'42	-0'53	30'80	27'90	-2'90	1'49	1'05	-0'44
Ceded District and Mysore	0'25	0'15	-0'10	4'82	4'46	-0'36	21'63	21'40	-0'23	2'57	5'91	+3'34
Carnatic	0'89	0'88	-0'01	3'97	3'19	-0'78	21'05	24'01	+2'96	10'97	20'12	+9'15
Nilgiris	2'05	1'86	-0'19	9'56	7'47	-2'09	26'85	31'55	+4'70	11'91	10'76	-1'15
Arakan	0'97	0'21	-0'76	16'37	5'87	-10'50	125'56	135'99	+10'43	2'52	0'09	-2'86
Pegu	0'22	0'29	+0'07	8'46	11'15	+2'69	66'57	63'60	-2'97	2'89	0'06	-2'83
Tenasserim	1'02	0'91	-0'11	22'02	27'99	+5'97	147'95	148'51	+0'56	2'32	0'89	-1'43
Upper Burma	0'24	0'14	-0'10	6'12	5'77	-0'35	29'78	30'57	+0'79	1'56	0'01	-1'55
Bay Islands	1'17	3'06	+1'89	15'03	30'33	+15'30	69'08	62'54	-6'54	11'73	3'59	-8'14

TABLE XX.—Average actual and normal rainfall data of the 57 meteorological divisions in India for the four seasons of the year 1898 and for the whole year.

Province.	Division.	JANUARY AND FEBRUARY			MARCH TO MAY.			JUNE TO OCTOBER.			NOVEMBER AND DECEMBER.			WHOLE YEAR.		
		Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
BURMA.	1. Tenasserim	0'94	0'07	+0'87	29'13	21'07	+8'06	157'70	150'02	+7'68	1'50	1'79	-0'29	189'27	172'95	+16'32
	2. Lower Burma Deltaic.	0'25	0'32	-0'07	15'01	11'96	+3'05	89'62	77'29	+12'33	0'04	4'14	-4'10	104'92	93'71	+11'21
	3. Central do.	0'15	0'19	-0'04	6'29	5'94	+0'35	44'71	50'83	-6'12	0'01	2'15	-2'14	51'16	59'11	-7'95
	4. Upper do.	0'25	0'24	+0'01	6'00	6'12	-0'12	34'94	36'99	-2'05	0'05	2'32	-2'27	41'24	45'67	-4'43
	5. Arakan	0'02	0'22	-0'20	6'78	19'34	-12'56	161'01	154'08	+6'93	0'05	4'40	-4'35	167'86	178'04	-10'18
BENGAL AND ASSAM.	6. Eastern Bengal	0'96	1'41	-0'45	9'39	17'23	-7'84	82'53	67'80	+14'73	0'10	1'62	-1'52	92'98	88'06	+4'92
	7. Assam Surma	1'79	1'97	-0'18	10'54	37'96	-27'42	81'17	85'31	-4'14	0'15	1'59	-1'44	93'65	126'83	-33'18
	8. Do. Hills	2'03	2'06	-0'03	13'70	25'29	-11'59	101'69	109'25	-7'56	0'30	1'58	-1'28	117'72	138'18	-20'46
	9. Do. Brahmaputra	2'88	2'39	+0'49	19'61	24'21	-4'60	64'32	61'21	+3'11	1'10	1'01	+0'09	87'91	88'82	-0'91
	10. Deltaic Bengal	0'86	1'64	-0'78	7'85	10'18	-2'33	53'60	47'67	+5'93	0'09	1'09	-1'00	62'40	60'58	+1'82
	11. Central do.	1'09	1'30	-0'21	5'24	7'74	-2'50	56'98	46'35	+10'63	0'01	0'68	-0'67	63'32	56'07	+7'25
	12. North do.	1'81	1'02	+0'79	12'55	15'56	-3'01	79'65	77'52	+2'13	0'15	0'25	-0'10	94'16	94'35	-0'19
	13. Bengal Hills	2'35	1'70	+0'65	13'15	18'39	-5'24	109'65	117'39	-7'74	1'14	0'66	+0'48	126'29	138'14	-11'85
	14. Orissa	0'16	1'19	-1'03	4'18	6'77	-2'59	50'06	51'40	-1'34	0'28	2'41	-2'13	54'68	61'77	-7'09
	15. Chota Nagpur	1'07	1'41	-0'34	2'23	4'02	-1'79	52'52	47'49	+5'03	0'23	0'71	-0'48	56'05	53'63	+2'42
NORTH-WESTERN PROVINCES AND OUDH.	16. South Bihar	1'36	1'30	+0'06	1'3	2'37	-1'06	50'93	39'82	+11'11	0'05	0'39	-0'34	53'65	43'88	+9'77
	17. North do.	1'04	1'21	-0'17	4'82	4'34	+0'48	54'05	47'17	+6'88	0	0'23	-0'23	59'91	52'95	+6'96
	18. North-Western Provinces East.	1'82	0'99	+0'83	0'20	0'91	-0'71	47'91	35'98	+11'93	0'13	0'37	-0'24	50'06	38'25	+11'81
	19. South Oudh	2'13	0'95	+1'18	0'49	0'99	-0'50	41'50	33'73	+7'77	0'27	0'43	-0'16	44'39	35'10	+8'29
	20. North do.	2'55	1'09	+1'46	1'08	1'55	-0'47	47'74	35'89	+11'85	0'36	0'42	-0'06	51'73	38'95	+12'78
	21. North-Western Provinces Central.	2'29	0'78	+1'51	0'20	0'73	-0'53	39'79	32'57	+7'22	0'43	0'39	+0'04	42'71	34'47	+8'24
	22. North-Western Provinces West.	4'11	0'88	+3'23	0'47	1'04	-0'57	20'42	24'06	-3'64	0'56	0'35	+0'21	25'36	26'33	-0'77
	23. North-Western Provinces East Sub-montane.	1'68	1'01	+0'67	1'46	1'75	-0'29	53'07	89'60	+13'47	0'02	0'27	-0'25	56'23	42'63	+13'60
	24. North-Western Provinces West Sub-montane.	4'87	2'50	+2'37	0'78	2'12	-1'34	41'24	41'07	+0'77	1'63	0'60	+1'03	49'12	46'29	+2'83
	25. North-Western Provinces Hills.	5'35	4'63	+0'72	2'62	5'15	-2'53	62'63	50'67	+11'96	2'58	0'73	+1'85	73'18	61'18	+12'00
PUNJAB.	26. South-East Punjab	2'53	1'13	+1'40	0'93	1'32	-0'39	13'28	20'76	-7'48	0'75	0'33	+0'42	17'49	23'54	-6'05
	27. South do.	2'25	1'08	+1'17	0'95	1'40	-0'45	9'60	13'21	-3'61	0'61	0'33	+0'28	13'41	16'02	-2'61
	28. Central do.	3'78	2'00	+1'78	0'91	2'36	-1'45	12'11	14'00	-1'89	0'40	0'52	-0'12	17'20	18'88	-1'68
	29. Punjab Sub-montane.	5'73	2'90	+2'83	0'87	2'69	-1'82	22'54	24'43	-1'89	1'34	0'75	+0'59	30'48	30'77	-0'29
	30. Do. Hills	6'33	6'55	-0'22	1'85	8'43	-6'58	42'51	45'43	-2'92	3'88	1'60	+2'28	54'57	62'03	-7'46

TABLE XX.—Average actual and normal rainfall data of the 57 meteorological divisions in India for the four seasons of the year 1898 and for the whole year—concl'd.

Province.	Division.	JANUARY AND FEBRUARY.			MARCH TO MAY.			JUNE TO OCTOBER.			NOVEMBER AND DECEMBER.			WHOLE YEAR.		
		Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.	Average actual rainfall.	Average normal rainfall.	Variation of actual from normal.
		Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
PUNJAB— concl'd.	31. North Punjab .	3'64	3'23	+0'41	3'26	4'55	—1'29	14'14	12'26	+1'88	0'60	1'23	—0'63	21'64	21'27	+0'37
	32. West do. .	2'01	0'98	+1'03	0'56	1'40	—0'84	5'44	6'25	—0'81	0'07	0'26	—0'19	8'08	8'89	—0'81
BOMBAY AND MALABAR COAST DIS- TRICTS (MAD- RAS).	33. A. Malabar .	0'16	0'35	—0'19	8'12	9'88	—1'76	110'68	112'08	—1'40	6'63	4'81	+1'82	125'59	127'12	—1'53
	33. Travancore .	3'85			8'88			58'00			8'37			79'10		
	34. Madras South- Central.	0'85	0'25	+0'60	5'76	6'06	—0'30	19'61	18'12	+1'49	11'61	5'16	+6'45	37'83	29'59	+8'24
	35. Coorg .	0			7'96			72'37			5'05			85'38		
	36. Mysore .	0'09	0'15	—0'06	5'45	5'15	+0'30	29'88	25'99	+3'89	6'81	3'19	+3'62	42'23	34'48	+7'75
	37. Konkan .	0'73	0'12	+0'61	1'27	2'08	—0'81	119'36	111'62	+7'74	1'77	1'24	+0'53	123'13	115'06	+8'07
	38. Bombay Deccan	0'34	0'10	+0'24	3'88	2'78	+1'10	32'83	31'86	+0'97	1'55	1'85	—0'30	38'60	36'59	+2'01
	39. Hyderabad North	1'12	0'16	+0'96	1'21	1'58	—0'37	27'49	32'53	—5'04	0'77	1'91	—1'14	30'59	36'18	—5'59
	40. Khandesh .	0'35	0'13	+0'22	9'36	1'23	—0'87	27'85	30'03	—2'18	0'62	1'48	—0'86	29'18	32'87	—3'69
	41. Berar .	0'45	0'65	—0'20	0'62	1'25	—0'63	26'31	37'48	—11'17	0'12	1'18	—1'06	27'50	40'56	—13'06
CENTRAL PRO- VINCES AND BERAR.	42. Central Provinces West.	1'03	0'77	+0'26	0'40	0'93	—0'53	40'10	42'05	—1'95	0'11	0'90	—0'79	41'64	44'65	—3'01
	43. Central Provinces Central.	2'69	0'77	+1'92	0'39	1'24	—0'85	52'01	48'80	+3'21	0'12	0'70	—0'58	55'21	51'51	+3'70
	44. Central Provinces East.	1'75	0'82	+0'93	0'62	1'94	—1'32	44'72	46'55	—1'83	0'05	0'77	—0'72	47'14	50'08	—2'94
	45. Guzarat .	1'26	0'08	+1'18	0'18	0'32	—0'14	42'50	43'39	—0'89	0'25	0'24	+0'01	44'19	44'03	+0'16
BOMBAY (NORTH).	46. Kathiawar .	0'48	0'14	+0'34	0'31	0'37	—0'06	22'16	26'20	—4'04	0'35	0'37	—0'02	23'30	27'08	—3'78
	47. Sind .	0'52	0'71	—0'19	0'14	0'60	—0'46	4'84	4'50	+0'34	0'03	0'18	—0'15	5'53	5'99	—0'45
	48. Baluchistan Hills	0'94	3'66	—2'72	2'33	1'72	+0'61	1'49	2'50	—1'01	0'19	1'62	—1'43	4'95	9'50	—4'55
RAJPUTANA AND CENTRAL INDIA.	49. Central India East	1'69	0'98	+0'71	0'85	0'76	+0'09	36'70	40'95	—4'25	0'28	0'73	—0'45	39'52	43'42	—3'90
	50. Rajputana East, Central India West.	1'34	0'69	+0'65	0'61	0'79	—0'18	17'27	26'19	—8'92	0'57	0'49	+0'08	19'79	28'16	—8'37
	51. West Rajputana .	0'69	0'43	+0'26	0'27	0'72	—0'45	7'05	11'13	—4'08	0'33	0'25	+0'08	8'34	12'53	—4'19
MADRAS	52. East Coast North	1'25	0'42	+0'83	2'38	3'29	—0'91	32'90	31'59	+1'31	4'64	4'27	+0'37	41'17	39'57	+1'60
	52A. Do do. do. (a)	0'60	0'26	+0'34	4'20	4'88	—0'68	45'53	51'93	—6'40	1'28	3'14	—1'86	51'61	60'21	—8'60
	53. Hyderabad South	0'74	0'26	+0'48	1'61	2'25	—0'64	25'96	25'43	+0'53	1'80	1'44	+0'36	30'11	29'38	+0'73
	54. Madras Central .	0'11	0'08	+0'03	2'99	2'49	+0'50	15'92	20'99	—5'07	4'41	2'74	+1'67	23'43	26'30	—2'87
	55. East Coast Central	0'29	0'67	—0'38	1'62	2'06	—0'44	20'96	20'52	+0'44	15'35	11'94	+3'41	38'22	35'19	+3'03
	56. East Coast South	0'77	0'77	0	2'67	4'19	—1'52	26'95	23'67	+3'28	27'48	13'79	+13'69	57'87	42'42	+15'45
	57. Madras South .	2'88	1'18	+1'70	4'41	5'12	—0'71	16'87	12'43	+4'44	12'95	10'14	+2'81	37'11	28'87	+8'24

TABLE XXI.—Average actual and normal number of rainy days of the 57 meteorological divisions of India for the four seasons of the year 1898 and for the whole year.

PROVINCE.	Division.	JANUARY AND FEBRUARY.			MARCH TO MAY.			JUNE TO OCTOBER.			NOVEMBER AND DECEMBER.			WHOLE YEAR.		
		Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.
BURMA	1. Tenasserim .	1'1			26'5			111'0			2'1			140'7		
	2. Lower Burma Deltaic.	0'5			17'5			101'0			0'2			119'2		
	3. Central do. .	0'3			8'4			71'5			0			80'2		
	4. Upper do. .	0'6			9'4			47'7			0'1			57'8		
	5. Arakan .	0			9'6			101'8			0'2			111'6		
BENGAL AND ASSAM.	6. Eastern Bengal.	1'7	2'5	-0'8	11'1	19'3	-8'2	76'2	71'0	+5'2	0'2	2'0	-1'8	89'2	94'8	-5'6
	7. Assam Surma .	3'5	4'2	-0'7	17'5	37'7	-20'2	83'9	84'1	-0'2	0'4	2'1	-1'7	105'3	128'1	-22'8
	8. Do. Hills .	5'5	4'6	+0'9	19'2	31'5	-12'3	89'5	90'5	-1'0	0'9	2'6	-1'7	115'1	129'2	-14'1
	9. Do. Brahma-putra.	6'8	6'6	+0'2	27'8	34'8	-7'0	68'8	69'0	-0'2	3'0	2'4	+0'6	106'4	112'8	-6'4
	10. Deltaic Bengal .	1'2	2'6	-1'4	10'5	14'0	-3'5	65'5	62'4	+3'1	0'2	1'4	-1'2	77'4	80'4	-3'0
	11. Central do. .	2'1	2'4	-0'3	7'8	11'1	-3'3	60'8	58'7	+2'1	0	1'0	-1'0	70'7	73'2	-2'5
	12. North do. .	3'4	2'1	+1'3	14'7	17'7	-3'0	69'6	64'9	+4'7	0'5	0'5	0	88'2	85'2	+3'0
	13. Bengal Hills .	5'2	3'6	+1'6	21'8	24'7	-2'9	86'0	90'6	-4'6	3'9	1'6	+2'3	116'9	120'5	-3'6
	14. Orissa .	0'4	2'0	-1'6	6'3	9'1	-2'8	54'8	59'5	-4'7	0'7	2'5	-1'8	62'2	73'1	-10'9
	15. Chota Nagpur .	1'7	2'8	-1'1	4'0	7'3	-3'3	57'7	58'5	-0'8	0'6	1'1	-0'5	64'0	69'7	-5'7
	16. South Bihar .	2'3	2'6	-0'3	2'6	3'6	-1'0	51'4	46'7	+4'7	0'2	0'6	-0'4	56'5	53'5	+3'0
	17. North do. .	2'8	2'4	+0'4	7'2	6'4	+0'8	50'6	49'9	+0'7	0	0'6	-0'6	60'6	59'3	+1'3
	18. North-Western Provinces, East.	2'7	2'2	+0'5	0'5	2'1	-1'6	49'6	40'9	+8'7	0'4	0'6	-0'2	53'2	45'8	+7'4
	19. South Oudh .	3'0	2'0	+1'0	1'3	2'2	-0'9	42'6	37'8	+4'8	1'2	0'7	+0'5	48'1	42'7	+5'4
NORTH-WESTERN PROVINCES AND OUDH	20. North do. .	3'6	2'1	+1'5	1'9	3'1	-1'2	47'6	38'1	+9'5	1'5	0'7	+0'8	54'6	44'0	+10'6
	21. North-Western Provinces, Central	2'8	1'9	+0'9	0'7	1'9	-1'2	42'5	36'2	+6'3	1'5	0'6	+0'9	47'5	40'6	+6'9
	22. North-Western Provinces, West.	4'0	2'2	+1'8	1'8	2'7	-0'9	24'0	27'5	-3'5	2'2	0'5	+1'7	32'0	32'9	-0'9
	23. North-Western Provinces East Submontane.	2'8	2'2	+0'6	2'4	3'1	-0'7	50'0	41'6	+8'4	0	0'6	-0'6	55'2	47'5	+7'7
	24. North-Western Provinces West Submontane.	5'8	4'5	+1'3	1'7	4'4	-2'7	38'3	37'3	+1'0	4'2	1'1	+3'1	50'0	47'3	+2'7
	25. North-Western Provinces Hills.	6'8	8'1	-1'3	5'7	11'1	-5'4	63'5	58'0	+5'5	4'8	1'7	+3'1	80'8	78'9	+1'9
	26. South-East Punjab.	4'5	2'5	+2'0	2'7	3'0	-0'3	18'0	22'7	-4'7	2'2	0'8	+1'4	27'4	29'0	-1'6
PUNJAB	27. South Punjab .	4'9	2'4	+2'5	1'8	2'9	-1'1	13'7	15'5	-1'8	1'5	0'6	+0'9	21'9	21'4	+0'5
	28. Central do. .	6'4	4'1	+2'3	2'3	4'8	-2'5	14'9	15'9	-1'0	1'4	0'8	+0'6	25'0	25'6	-0'6
	29. Punjab Submontane.	7'6	5'0	+2'6	2'0	4'9	-2'9	25'8	23'8	+2'0	2'0	1'1	+0'9	37'4	34'8	+2'6
	30. Punjab Hills .	10'6	8'8	+1'8	5'8	13'2	-7'4	44'2	46'0	-1'8	6'0	2'2	+3'8	66'6	70'2	-3'6

TABLE XXI.—Average actual and normal number of rainy days of the 57 meteorological divisions of India for the four seasons of the year 1898 and for the whole year—concl'd.

PROVINCE.	DIVISION.	JANUARY AND FEBRUARY.			MARCH TO MAY.			JUNE TO OCTOBER.			NOVEMBER AND DECEMBER.			WHOLE YEAR.		
		Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.	Average actual number of rainy days.	Average normal number of rainy days.	Variation of actual from normal.
PUNJAB—concl'd.	31. North Punjab .	6.8	5.4	+1.4	8.0	7.7	+0.3	17.2	15.4	+1.8	1.2	1.6	-0.4	33.2	30.1	+3.1
	32. West do. .	3.7	2.2	+1.5	1.2	2.9	-1.7	7.1	8.6	-1.5	0.3	0.4	-0.1	12.3	14.1	-1.8
BOMBAY AND MALABAR COAST DISTRICTS (MADRAS).	33. Malabar .	0.3	0.5	-0.2	11.4	12.4	-1.0	103.7	99.8	+3.9	9.1	7.0	+2.1	124.5	119.7	+4.8
	33-A. Travancore .	3.4			13.4			68.9			13.1			98.8		
	34. Madras South-Central.	1.2	0.5	+0.7	9.3	9.0	+0.3	31.4	27.8	+3.6	14.0	8.5	+5.5	55.9	45.8	+10.1
	35. Coorg .	0			13.8			100.5			8.6			122.9		
	36. Mysore .	0.2	0.3	-0.1	9.5	8.7	+0.8	44.8	39.4	+5.4	8.6	4.9	+3.7	63.1	55.3	+7.8
	37. Konkan .	1.2	0.2	+1.0	2.9	3.2	-0.3	96.5	94.3	+2.2	2.4	2.0	+0.4	103.0	99.7	+3.3
	38. Bombay Deccan	0.9	0.3	+0.6	7.4	5.6	+1.8	48.4	46.1	+2.3	2.9	3.1	-0.2	59.6	55.1	+4.5
	39. Hyderabad, North	1.4			2.4			44.0			2.0			49.8		
CENTRAL PROVINCES AND BERAR.	40. Khandesh .	0.7	0.2	+0.5	0.8	2.1	-1.3	41.9	42.0	-0.1	1.4	2.2	-0.8	44.8	46.5	-1.7
	41. Berar .	1.3			1.8			42.4			0.3			45.8		
	42. Central Provinces, West.	1.6	1.4	+0.2	0.9	2.1	-1.2	48.2	49.1	-0.9	0.2	1.2	-1.0	50.9	53.8	-2.9
	43. Central Provinces, Central.	2.2	1.7	+0.5	1.1	2.8	-1.7	59.6	52.4	+7.2	0.3	1.1	-0.8	63.2	58.0	+5.2
	44. Central Provinces, East.	1.4	1.7	-0.3	1.7	3.7	-2.0	54.0	49.5	+4.5	0.2	1.3	-1.1	57.3	56.2	+1.1
	45. Gujarat .	1.3	0.2	+1.1	0.4	0.5	-0.1	40.1	47.5	-7.4	0.8	0.5	+0.3	42.6	48.7	-6.1
	46. Kathiawar .	0.9	0.3	+0.6	0.5	0.6	-0.1	25.3	27.4	-2.1	0.9	0.2	+0.7	27.6	28.5	-0.9
	47. Sind .	1.1			0.5			5.8			0.1			7.5		
BOMBAY (NORTH)	48. Baluchistan Hills	1.9			5.9			2.7			0.7			11.2		
RAJPUTANA AND CENTRAL INDIA	49. Central India, East	2.5			0.2			42.5			0.9			45.1		
	50. Rajputana East, Central India, West	2.6			2.0			22.0			1.7			28.3		
	51. West Rajputana	1.5			0.7			8.7			1.1			12.0		
MADRAS	52. East Coast, North	1.1	0.7	+0.4	4.3	5.2	-0.9	43.2	43.5	-0.3	3.8	4.3	-0.5	52.4	53.7	-1.3
	52-A. Do. do. (a)	1.0	0.7	+0.3	9.0	9.7	-0.7	73.5	67.6	+5.9	3.0	5.3	-2.3	86.5	83.3	+3.2
	53. Hyderabad, South	1.5			4.0			40.9			3.0			49.4		
	54. Madras, Central	0.3	0.2	+0.1	4.7	4.2	+0.5	29.4	30.7	-1.3	6.5	4.2	+2.3	40.9	39.3	+1.6
	55. East Coast Central	0.7	0.8	-0.1	2.3	2.5	-0.2	27.9	27.1	+0.8	11.6	10.5	+1.1	42.5	40.9	+1.6
	56. East Coast South	1.4	1.0	+0.4	4.1	4.8	-0.7	36.1	31.6	+4.5	21.3	14.0	+7.3	62.9	51.4	+11.5
	57. Madras, South	4.1	1.8	+2.3	6.6	7.5	-0.9	24.6	19.2	+5.4	19.0	13.1	+5.9	54.3	41.6	+12.7

I.—The cold weather period.—The rainfall of the period was very abnormal in its occurrence and distribution. It was scanty and in defect, relatively to the normal, over nearly the whole of India in January. Two cold-weather storms of moderate intensity affected the weather in Northern India in that month. The precipitation due to these storms occurred chiefly in the Punjab and Kashmir. The most noteworthy feature of these storms in the Himalayan area was that the accompanying snowfall was confined to considerably greater elevations than usual, and was hence small in amount, except perhaps on the interior and higher ranges.

The chief feature of the month of February was the occurrence of general rain over practically the whole of India from the 9th to the 18th. This was due to a succession of depressions which originated in India. The most important depression originated much further south than usual in Kathiawar, Gujarat and South-West Rajputana on the 8th and 9th. The general disturbance due to the series of depressions gradually extended over the whole of India, and the burst of rain accompanying it was the most general and widely spread that has occurred in February during the past 20 years.

The following data show that the precipitation of the period was generally in moderate excess at the hill stations in Upper India :—

STATION.	RAINFALL.					
	Actual, January 1898.	Actual, February 1898.	Total actual of period, January and February 1898.	Mean normal of period, January and February.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	Inches.	Inches.	
Murree	1'64	5'75	7'39	7'25	+0'14	+ 2
Simla	0'79	5'20	5'99	5'03	+0'96	+ 19
Dalhousie	2'18	10'77	12'95	5'80	+7'15	+123
Dharmasala	1'59	9'29	10'8	8'95	+1'93	+ 22
Mussooree	0'50	8'16	8'56	5'72	+2'94	+ 51
Ranikhe	0'25	6'1	6'11	4'89	+1'52	+ 31
Kailang	0'74	5'94	3'58	7'94	-4'26	- 54

Accurate snowfall measurements are now made at several stations in the Punjab Himalayas. The following

gives the amounts registered at six of these stations, where the measurements are believed to be carefully taken :—

DISTRICT OR STATE.	STATION.	Height in feet above sea level.	TOTAL SNOW-FALL IN THE MONTH OF		Total.	Approximate normal snowfall of period.
			January 1898.	February 1898.		
			Ft. In.	Ft. In.	Ft. In.	Ft. In.
PUNJAB	Murree	6,344	1 4	4 6½	5 10½	12 9
	Tisa Kilar	8,000	1 7	4 4	5 11	—
CHAMBA	Thaneia	7,000	1 1	8 1	9 2	—
	Kalatop	8,000	5 5	7 11	13 4	—
GARHWAL	Malla Danpur	—	2 2	11 0	13 2	—
	Malla Johar	—	9 0	29 0	38 0	—

The snowfall of the period was probably considerably below the normal over the whole of the Western Himalayan area.

The accumulation of snow at the end of the winter was not so large as in 1896-1897, and was probably below the normal.

The rainfall of the period was normal or in slight defect in Bihar and Chota Nagpur, and in considerable excess in the North-Western Provinces, Central India, Rajputana and the Punjab, due to the heavy rainfall of the month of February. The following gives comparative data for those provinces derived from the whole of the available data employed in the preparation of Table XX :—

AREA.	RAINFALL OF PERIOD, JANUARY AND FEBRUARY.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Punjab	3'32	1'88	+1'44	+ 77
North-Western Provinces and Oudh	2'78	1'17	+1'61	+138
Rajputana	1'02	0'56	+0'46	+ 82
Central India	1'69	0'98	+0'71	+ 72
Bihar	1'20	1'26	-0'06	- 5
Chota Nagpur	1'07	1'41	-0'34	- 24

The rainfall of the period was much below the normal in Persia and Baluchistan, and slightly below in

Sind. The following gives data for representative stations :—

STATION.	RAINFALL OF PERIOD, JANUARY AND FEBRUARY.			
	Actual, 1898.	Normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Baghdad	2'47	4'08	-1'61	-39
Bushire	1'33	5'90	-4'57	-77
Quetta	1'51	4'32	-2'81	-65
Kalat	0'72	4'51	-3'79	-84
Kabul	0'33	?	?	?
Jacobabad	0'07	0'65	-0'58	-89
Hyderabad	0'34	0'54	-0'20	-37

The rainfall of the period was scanty and below the normal in Bengal and Orissa, and normal in Assam, as is shown by the following data :—

AREA.	RAINFALL OF PERIOD, JANUARY AND FEBRUARY.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Assam	2'34	2'18	+0'16	+7
Bengal	1'18	1'34	-0'16	-12
Orissa	0'16	1'19	-1'03	-87

The rainfall of the period was in very large excess over the whole of the Peninsula, excepting Berar and Mysore where it was in slight defect. The following gives data :—

AREA.	RAINFALL OF PERIOD, JANUARY AND FEBRUARY.					
	Average actual, January 1898.	Average actual, February 1898.	Average actual of period, January and February 1898.	Average normal, January and February.	Variation from normal of period.	Percentage variation from normal.
	Inches.	Inches.	Inches.	Inches.	Inches.	
Berar	0	0'45	0'45	0'65	-0'20	-31
Central Provinces . .	0	1'82	1'82	0'79	+1'03	+130
Bombay Deccan . .	0	0'34	0'34	0'10	+0'24	+240
Konkan	0	0'73	0'73	0'12	+0'61	+508
Hyderabad	0	0'93	0'93	0'21	+0'72	+343
Madras (Central) . .	0	0'11	0'11	0'08	+0'03	+38
Mysore	0	0'09	0'09	0'15	-0'06	-40
Madras (South Central)	0'04	0'81	0'85	0'25	+0'60	+240
Madras (South) . .	1'59	1'29	2'88	1'18	+1'70	+144

The rainfall during the period from the 9th to the 18th in many cases accompanied thunderstorms of considerable intensity. The following gives a statement of falls in 24 hours exceeding four inches :—

PROVINCE.	DISTRICT.	STATION.	DATE.	Rainfall in 24 hours preceding 8 A. M. of date.
				Inches
Punjab . .	Umballa .	Umballa .	11th Feb. 1898.	5'83
"	Hoshiarpur .	Garhshankar .	" " "	4'11
"	Umballa .	Kharar .	" " "	4'07
North-Western Provinces.	Almora .	Champawat .	" " "	4'95
"	Naini Tal .	Naini Tal .	" " "	4'05
"	Muzaffarnagar .	Budhana .	10th " "	4'03
Madras . .	South Arcot .	Thiruvananthapuram .	12th " "	4'72

II.—The hot weather period.—March was much drier than usual. A series of five depressions crossed Northern India, but they gave no rain over the greater part of the area they traversed or affected. Each of the depressions gave rain in Baluchistan, the North Punjab and Kashmir, and moderate to heavy snow in Chitral, the Afghan mountains and the higher ranges of Kashmir. April was abnormally dry and the rainfall very scanty in Extra-Tropical India. It was in large and serious defect in the Assam Valley, Cachar and parts of North Bengal, thus affecting the tea and other crops very prejudicially. Bengal and Assam had series of thunderstorms on the 12th and 13th and the 17th, 18th and 19th, and Southern India and the West Coast from the 25th to the 28th.

May, like the preceding two months, was less disturbed than usual and the rainfall was below the normal over the greater part of India, but more especially in North Eastern India where it was largely in defect. Burma, on the other hand, had more frequent and abundant rain than usual. This pre-monsoon burst of rain in Burma was initiated by a cyclonic storm which advanced from the Bay across the Arakan Coast in the second week of the month.

The following is a summary of the principal features of the distribution of the rainfall of the period :—

- (1) The rainfall of the period was below the normal in March and April and above in May over the whole of Burma and was on the whole in considerable excess in the coast districts, normal in the interior and

in large defect in Arakan. The following gives comparative data :—

DIVISION.	RAINFALL OF PERIOD, MARCH TO MAY.					
	Actual, March 1898	Actual, April 1898	Actual, May 1898	Actual of period, March to May 1898.	Normal of period, March to May.	Percentage variation from normal.
Tenasserim . . .	Inch. 0'04	h. 2'79	Inches. 26'30	Inches. 29'13	Inches. 21'07	+38
Lower Burma (Deltaic) .	0'02	1'43	13'56	15'01	11'96	+26
Central „ . . .	0	0'33	5'96	6'29	5'94	+6
Upper „ . . .	0'02	0'88	5'10	6'00	6'12	-2
Arakan . . .	0	0'05	6'73	6'78	19'34	-65

- (2) The period was much drier throughout in Bengal and Assam, and the rainfall of the period was in general defect. The deficiency was large and marked in those districts which usually receive moderately heavy rain in April and May, *viz.*, Assam, East Bengal and Sikkim. The following table gives comparative data for this area :—

DIVISION.	Variation from normal of rainfall.				
	March 1898.	April 1898.	May 1898.	Total of period, March to May 1898.	Percentage variation of period.
	Inches.	Inches.	Inches.	Inches.	
Assam (Surma) . .	-7'44	-8'50	-11'48	-27'42	-72
„ (Brahmaputra) .	-3'21	+0'46	-1'85	-4'60	-19
Eastern Bengal . .	-2'34	-2'98	-2'52	-7'84	-46
Deltaic „ . .	-1'64	-1'11	+0'42	-2'33	-23
Central „ . .	-0'99	-0'36	-1'15	-2'50	-32
North „ . .	-1'15	-0'37	-1'49	-3'01	-19
Orissa . . .	-1'21	+0'31	-1'69	-2'59	-38
Bihar North . .	-0'34	+0'14	+0'68	+0'48	+11
Assam Hills . .	-2'86	-0'40	-8'33	-11'59	-46
Bengal „ . .	-1'49	+1'55	-5'30	-5'24	-28

- (3) The rainfall of the period was more or less in defect in Northern India, and normal in Central India which usually obtain very scanty rain, chiefly from local thunderstorms. This area of slight to moderate deficiency in the actual amount of the rainfall included South Bihar, Chota Nagpur, the North-Western Provinces, the Punjab, Rajputan

Gujarat and Sind, for which data are given below :—

DIVISION OR AREA.	RAINFALL OF PERIOD, MARCH TO MAY			
	Average actual 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
South Bihar	1'31	2'37	-1'06	-45
Chota Nagpur	2'23	4'02	-1'79	-45
North-Western Provinces and Oudh	0'67	1'30	-0'63	-48
Central India	0'85	0'76	+0'09	+12
Rajputana	0'44	0'76	-0'32	-42
Gujarat	0'18	0'32	-0'14	-44
Kathiawar	0'31	0'37	-0'06	-16
Sind	0'14	0'60	-0'46	-77
Punjab	1'25	2'29	-1'04	-45

- (4) The precipitation was also in defect over the whole of the Peninsula. It was in slight excess in April, but in slight defect in March, and in moderate to large defect in May. The rainfall of the whole period was hence more or less below the normal over the whole area, except in the Bombay Deccan, Central Madras and Mysore, where it was normal or in slight excess. The deficiency was large in May in the Malabar Coast districts, which usually receive heavy rain in the last week or ten days of the month. The following gives comparative data for this area of deficient rainfall in the hot weather of 1898 :—

DIVISION.	VARIATION FROM NORMAL OF RAINFALL.				
	March 1898.	April 1898.	May 1898.	Total of period, March to May 1898.	Percentage variation from normal.
	Inch.	Inches.	Inches.	Inches.	
Berar	-0'43	+0'16	-0'36	-0'63	-50
Central Provinces . .	-0'39	-0'15	-0'36	-0'90	-66
Malabar	-0'32	+0'69	-2'13	-1'76	-18
Konkan	+0'01	+0'39	-1'21	-0'81	-39
Khandesh	-0'03	-0'06	-0'78	-0'87	-71
Bombay Deccan . .	+0'10	+1'22	-0'22	+1'10	+40
Hyderabad	-0'28	+0'45	-0'67	-0'50	-26
Madras (Central) . .	-0'10	+1'06	-0'46	+0'50	+20

DIVISION.	VARIATION FROM NORMAL OF RAINFALL.				
	March 1898.	April 1898.	May 1898.	Total of period, March to May, 1898.	Percentage variation from normal.
	Inch.	Inch.	Inches.	Inches.	
Madras (East Coast, North).	—0'48	+0'18	—0'61	—0'91	—28
Madras (East Coast, Central).	—0'21	+0'09	—0'38	—0'44	—21
Madras (East Coast, South).	—0'36	+0'29	—1'45	—1'52	—36
Madras (South).	—0'90	+0'26	—0'07	—0'71	—14
Mysore	—0'27	+0'80	—0'23	+0'30	+ 6

III.—The south-west monsoon period.—The rainfall of the period was slightly above the normal on the mean of the whole of India, and was also favourably distributed in time except in the Punjab, Rajputana, Central India and the Central Provinces, where the rains terminated earlier than usual. The monsoon currents were slightly below their mean strength in June, but were strong in July, and in these months the favourable pressure and other conditions determined them to their extreme limits in Upper India.

The burst of heavy rain which usually initiates the monsoon in the west coast districts commenced slightly later than usual, viz., on the 9th and 10 June.

The Bay current was established over the north of the Bay and in Bengal about the normal date. A storm formed in the north-west of the Bay in front of the advancing current, and the first burst of heavy general rain in North-Eastern India accompanied the advance of this storm.

The following gives the dates of the establishment of the monsoon (i.e., of the commencement of the heavy rainfall which marked the first burst of the monsoon) in different parts of India in 1898:—

PROVINCE.	Date of commencement of the monsoon rains in 1898.
Malabar	9th June.
Konkan	10th "
Kathiawar	10th "
Central Provinces (East)	14th "
Central Provinces (West)	10th "
Central India	10th "
Rajputana	11th "
Bengal	16th "
Chota Nagpur	16th "
Bihar	18th "
North-Western Provinces	11th "
East Punjab	15th "

The rains held with unusual steadiness throughout July, August and the greater part of September. In August and September the Bay current was directed more largely than usual to Burma and North-Eastern India, and the Arabian Sea current to the Peninsula. The rainfall was hence considerably below the 'normal' in North-Western and Central India during these months

and the monsoon currents finally retreated from these areas earlier than usual.

The following gives the approximate dates of the termination of the rains in Northern and Central India:—

PROVINCE.	Date of termination of the monsoon rains in 1898.
East Punjab	16th September
North-Western Provinces	23rd "
Bihar	15th October
Bengal	16th "
Rajputana	16th September
Central India	17th "
Central Provinces	30th "
Bombay	27th October

The following is a brief statement of the chief features of the rainfall in India, month by month, during the south-west monsoon period of 1898.

June.—The advance of the monsoon currents over the Arabian Sea (the continuation of the south-east trades) was very slightly later than usual. It began on the 27th and 28th of May in the south-west of that area. The advance gave rise to squally winds and much rain in the centre of that area. This squally weather developed into a cyclonic storm, which formed in about Lat. 11½°N and Long. 59½° E. on the 31st May and advanced along a northerly track to the north-east coast of Arabia and the West Mekran Coast of Baluchistan, and broke up against the hills near the Mekran Coast on the 4th and 5th. It gave heavy rain to Muscat, Jask and the hills to the north of the Mekran Coast.

The dispersion of this storm was immediately followed by the establishment of the monsoon rains on the West Coast. Malabar began to receive heavy rain from the 6th, and the Konkan from the 10th. Heavy rain fell almost continuously from the 9th to the 18th, and North Kanara received exceptionally heavy downpours during this period, more especially on the 14th and 15th.

The following gives the total average rainfall in the coast districts from the 9th to the 18th:—

DISTRICT.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF										Total rainfall of period, 9th to 18th June 1898.
	9th June 1898.	10th June 1898.	11th June 1898.	12th June 1898.	13th June 1898.	14th June 1898.	15th June 1898.	16th June 1898.	17th June 1898.	18th June 1898.	
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
Malabar	1'61	1'18	1'04	1'51	1'98	3'25	2'10	1'11	1'64	1'61	17'33
South Canara	12'28	2'68	2'56	2'38	3'07	4'05	2'87	1'08	2'53	3'67	27'17
North Kanara	2'70	1'84	2'55	2'24	1'96	3'29	1'40	1'15	1'61	2'87	21'61
Ratnagiri	0'57	1'28	4'72	2'25	2'27	6'01	5'90	3'90	4'06	1'65	33'61
Kolaba	0'49	1'10	1'86	0'87	1'40	4'52	3'18	4'32	3'31	2'34	23'39
Thana	0'15	0'40	2'00	0'78	0'83	2'66	1'55	2'88	1'37	2'02	14'64

The humid current extended rapidly into the interior, and gave moderate to heavy showers in Berar, the Central Provinces, Central India, Rajputana and the East Punjab during the latter part of the second and the third week of the month. The strength of the current fell off rapidly on the West Coast on the 17th and 18th and was considerably below the normal from the 19th to the 26th. Concurrently with this change occurred a contraction of the area of rainfall due to this current. A break in the rains (with northerly to westerly winds) set in over the Punjab, Rajputana and Central India on the 18th and 19th, and in Berar, the Central Provinces and the Deccan on the 21st. Light showers fell in the West Coast districts during the period of the break. Winds increased again in force on the 26th and 27th, and rain recommenced in the Deccan, Berar and the Central Provinces on the 28th and extended northwards into the East Punjab at the end of the month.

The rains in Bengal commenced in the usual manner with the formation of a storm in the north of the Bay. Its advance across the coast into the interior gave the first heavy burst of rain in North-Eastern India. The storm followed an unusual track, advancing across the Orissa Coast on the 15th. The centre marched along a curved path through South-West Bengal on the 16th and 17th, and Central Bengal on the 18th, and broke up in North Bengal on the 19th and 20th. It travelled with unusual slowness (at an average rate of about three miles per hour) and gave a very heavy downpour to the whole of North-Eastern India.

The following gives the total average rainfall received in each of the seven divisions of the province of Bengal from the 14th to the 21st :—

DIVISION.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF								Total of period 14th to 21st June 1898.
	14th June 1898.	15th June 1898.	16th June 1898.	17th June 1898.	18th June 1898.	19th June 1898.	20th June 1898.	21st June 1898.	
	Inch.	Inch.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Eastern Bengal	0'17	0'45	0'68	1'83	3'09	2'43	1'62	1'61	11'88
North „	0'27	0'55	0'37	0'52	1'09	1'62	2'91	2'36	9'69
South-West „	0'09	0'23	0'47	1'53	1'95	2'36	0'39	0'09	7'11
Chota Nagpur .	0	0'16	0'53	2'99	3'88	1'23	0'14	0'04	8'97
Orissa .	0'42	0'90	1'27	0'19	0'13	0'37	0'01	0	3'29
South Bihar .	0'28	0	0'10	0'35	0'50	0'52	0'36	0'12	2'23
North „	0'54	0'03	0'05	0'11	0'32	0'70	1'05	0'39	3'19

Very heavy downpours were received, more especially in Chota Nagpur, of which the following are examples :—

DISTRICT.	Station.	Date.	Rainfall during 24 hours preceding 8 A.M. of date.
HAZARIBAGH . . .	Chatra . . .	17th June 1898.	Inches. 12'39
MANBHUM . . .	Purulia . . .	18th „ „	17'27
„	Jhalda . . .	„ „ „	12'88
BANKURA . . .	Bankura . . .	„ „ „	12'48
„	Khatra . . .	„ „ „	10'27
CHITTAGONG . . .	Kodala . . .	„ „ „	10'20
MURSHIDABAD . . .	Kandi . . .	19th „ „	11'52

The humid winds, as already pointed out, retreated from North-Western India on the 18th and 19th. After the breaking up of the cyclonic storm in North Bengal, the humid current from the Bay was chiefly determined to Bengal and Assam, and North and East Bengal received a heavy downpour from the 21st to the 23rd. The break in the rains initiated in Upper India on the 18th, extended to Bengal on the 25th, and fine dry weather prevailed over the whole of Northern and Central India until the 28th. The humid currents strengthened in the coast districts on the 26th and 27th, and extended rapidly into the interior on the 28th and 29th. Rainfall was again fairly general on the 30th.

The rainfall of the month was in excess in the West Coast districts and normal in the Central Provinces and the Punjab. It was in slight to moderate defect in Central India East, Rajputana, the Madras Presidency, Berar, Khandesh and Hyderabad. The Bay current gave normal rain to the Gangetic Plain and Bengal, and decreased rain to Burma.

The following gives a brief summary of the data showing roughly the distribution of the rainfall of the month :—

AREA.	RAINFALL.			
	Average actual, June 1898.	Average normal, June.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma	23'71	27'05	-3'34	-12
Bengal	15'72	14'71	+1'01	+ 7
Assam	17'17	19'54	-2'37	-12
North-Western Provinces and Oudh.	4'71	4'31	+0'40	+ 9
Punjab	1'50	1'68	-0'18	-11
Rajputana	1'19	2'50	-1'31	-52
Gujarat	9'28	6'26	+3'02	+48
Central India	4'54	6'52	-1'98	-30
Kathiawar	3'77	3'26	+0'51	+16
Konkan	31'12	27'14	+3'98	+15
Khandesh	4'37	5'69	-1'32	-23
Bombay Deccan	7'11	5'80	+1'31	+23
Berar	5'74	7'17	-1'43	-20
Central Provinces	7'27	7'97	-0'70	- 9
Hyderabad	3'82	5'05	-1'23	-24
Madras	7'06	7'41	-0'35	- 5

July —The Bombay current was of normal strength and even steadier than usual on the mean of the month. It was vigorous during three periods, viz., from the 1st to 7th, the 13th to the 23rd and the 27th to the end of the month. It extended to its utmost limits in Upper India during the month, and gave somewhat heavier rain than the

normal over the whole area which obtains its rain supply in July from this current, with the exception of the greater part of Madras, parts of the Punjab, East Rajputana and Central India. The rainfall in the West Coast districts was very heavy in the second period. The following gives data in illustration :—

DISTRICT.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 AM OF DATE											Total of period 13th to 23rd July 1898.
	13th July 1898.	14th July 1898.	15th July 1898.	16th July 1898.	17th July 1898.	18th July 1898.	19th July 1898.	20th July 1898.	21st July 1898.	22nd July 1898.	23rd July 1898.	
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
North Kanara	0'80	0'74	0'60	0'48	0'94	1'74	1'16	0'88	1'36	0'64	0'76	10'10
Savantvadi	1'25	1'56	3'28	0'96	1'09	1'81	1'18	2'99	4'10	2'12	4'87	25'21
Ratnagiri	0'61	3'67	2'35	1'54	1'08	1'16	0'77	2'12	4'35	4'97	4'35	26'97
Kolaba	3'34	4'50	2'25	2'21	2'01	1'59	1'97	2'74	5'26	7'18	4'53	37'58
Thana	2'45	2'55	0'86	1'55	1'04	0'82	0'97	0'53	2'91	4'41	4'91	23'00
Broach	0'19	1'40	0'26	0'18	0'38	0'02	0'72	0'96	1'76	0'20	3'69	9'76
Surat	0'66	0'14	0'23	0'11	0'17	0'23	0'77	0'68	0'55	0'62	3'53	7'74

The distribution of the rainfall in Northern India was chiefly determined by three cyclonic storms. The first formed on the 30th June and 1st July at the head of the Bay, and advanced through Chota Nagpur, Central India and Rajputana into Lower Sind. Bengal, Bihar, Chota Nagpur, the North-Western Provinces, the Central Provinces, Central India and Rajputana received general rain during the advance of this storm from the 2nd to the 7th. The dispersion of the storm was also followed by a brief period of general rain in Upper India from the 10th to the 13th.

The second depression formed in Central Bihar on the 13th and 14th during a period of heavy rainfall in Bihar and Bengal. It marched from Bihar across the North-Western Provinces, Rajputana and Sind, and gave moderate to heavy rain to Bihar, the North-Western Provinces, Rajputana and Sind during the period from the 14th to the 22nd. Moderate rain continued in Upper India until the 24th.

The third depression of the month formed off the coast of North Madras and advanced westwards into the North Deccan. It formed much further south than storms usually do in July. The Deccan and Northern and Central India received moderately heavy rain from the storm. Its dispersion was followed by an influx of humid winds into North-Eastern India, and Bengal, Bihar and the North Western Provinces obtained heavy rain from the 27th to the end of the month. The rainfall was generally in excess in the interior of the country, more especially in the North-Western Provinces, the greater part of the Punjab and the Deccan. It was somewhat irregularly distributed in the coast districts, but was on the whole normal in amount,

It was less than usual in Assam, Central, North and East Bengal, Orissa, North Bihar, the South-East Punjab, Punjab Hills, East Rajputana, Central India and South India.

The following table shows approximately the general character of the rainfall distribution of the month: —

AREA.	RAINFALL.			
	Average actual, July 1898.	Average normal, July.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma	25'02	28'34	-3'32	-12
Bengal	13'42	15'45	-2'03	-13
Orissa	9'91	11'67	-1'76	-15
Assam	15'67	17'52	-1'85	-11
Bihar	12'47	12'95	-0'48	-4
North-Western Provinces and Oudh.	12'63	11'75	+0'88	+7
Punjab	7'20	5'59	+1'61	+29
Berar	10'03	11'59	-1'56	-15
Central Provinces	17'82	15'97	+1'85	+12
Rajputana	6'43	6'51	-0'08	-1
Central India	13'03	13'53	-0'50	-4
Gujarat	19'63	18'46	+1'17	+6
Kathiawar	10'50	11'27	-0'77	-7
Konkan	46'82	40'04	+6'78	+17
Bombay Deccan	9'44	9'39	+0'05	+1
Madras	7'93	7'61	+0'32	+4

August.—The Arabian Sea current was below its strength during the greater part of the month. Its extension into Upper India was hence very feeble, and drier weather than usual obtained during the month in that area. The current was determined to a greater extent than usual across the Deccan, Berar and the Central Provinces. The rainfall of the month under these conditions was hence in marked defect in the Punjab, Rajputana, Central India (West), North Bombay and Berar, and in moderate to considerable defect in the Deccan, Southern India and the West Coast districts.

The Bay current was more vigorous than usual, and was also determined more to the east and north-east than usual with the consequence that the coast districts of Arakan and Burma received abundant and excessive rain. Thus Arakan obtained an average of 56·05 inches, 23·15 inches above the normal. Numerous depressions of small intensity formed during the month, as is usually the case when a strong steady current obtains in the Bay in July and August. These depressions formed in the land area of North-Eastern India in limited districts of heavy local rainfall. There were in all seven depressions of slight to moderate intensity, and six of these formed over the land. They almost, without exception, advanced from Bengal across Bihar and Chota Nagpur into the North-Western Provinces, and gave abundant rain to those provinces and also in a somewhat less degree to the eastern and central districts of the Central Provinces and the eastern states of Central India.

The rainfall of the month was hence in more or less considerable excess over the whole of these areas and in Burma.

The following summary of the rainfall data of the month shows approximately the distribution and character of the rainfall of the month :—

AREA.	RAINFALL.			
	Average actual, August 1898.	Average normal, August.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma	29·73	23·19	+6·54	+28
Bengal	18·04	14·10	+3·94	+28
Assam	19·78	17·50	+2·28	+13
Bihar	13·98	12·21	+1·77	+14
North-Western Provinces and Oudh	16·71	10·55	+6·16	+58
Punjab	2·22	5·00	—2·78	—56
Rajputana	2·26	6·76	—4·50	—67
Berar	4·29	8·89	—4·60	—52
Central Provinces . .	13·58	11·76	+1·82	+15

AREA.	RAINFALL.			
	Average actual, August 1898.	Average normal, August.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Central India . . .	13·65	12·24	+1·41	+12
Gujarat	6·01	9·28	—3·27	—35
Kathiawar	3·10	6·28	—3·18	—51
Konkan	17·70	23·96	—6·26	—26
Bombay Deccan . . .	3·64	6·14	—2·50	—41
Madras	4·02	6·48	—2·46	—38

September.—As in the preceding month, the Arabian Sea current was feebler than usual and was diverted from North-Western India and determined more largely to the Peninsula than usual. The chief periods of rainfall due to this current were the 1st to the 9th 10th to the 16th, and the 20th to the end of the month.

During the first and third periods the rainfall occurred chiefly in the West Coast, Deccan and Southern India.

In the second period the humid current gave moderate rain to the Deccan and also to North-Western and Central India. This was the last general rain of the south-west monsoon period in North-Western and Central India, where the rains hence terminated on the 16th or 17th of September, somewhat earlier than usual.

The rainfall of the month was in considerable defect in the Punjab, Rajputana, Central India, Berar and the Central Provinces. It was, on the other hand, in moderate to large excess in the West Coast, the Deccan, Madras Coast and Southern India.

The Bay current was of normal strength in September. There were three periods of general rainfall in the Gangetic Plain and Bengal. The first was from the 3rd to the 10th. The chief feature of the period was a very heavy downpour in North Bihar on the 7th and 8th. The following gives average data for the districts in which it occurred :—

DISTRICT.	RAINFALL OF PERIOD.	
	7th and 8th September 1898.	4th to 10th September 1898.
	Inches.	Inches.
Saran	6·12	11·46
Champaran	9·63	16·96
Muzaffarpur	4·84	10·21
Darbhanga	1·36	6·97
Purnea	5·25	14·84

The rainfall of the second and third periods accompanied the march of cyclonic storms. In consequence of the earlier commencement of the increase of pressure accompanying the termination of the rains in Upper India, these storms advanced along more northerly tracks than usual.

The first of these formed in the north-west angle of the Bay on the 10th and 11th, and advanced through Orissa, Chota Nagpur and South Bihar into North Bihar. It gave a heavy burst of rain in North-Eastern India and excessive downpours in the sub-montane districts of North Bihar and North Bengal when it was breaking up.

The following gives average rainfall data for the 15th and 16th in the districts in which the fall was most excessive :

DISTRICT.	AVERAGE ACTUAL RAINFALL DURING 24 HOURS PRECEDING 8 A.M. OF		TOTAL RAINFALL OF PERIOD.
	15th September 1898.	16th September 1898.	15th and 16th September 1898.
	Inches.	Inches.	Inches.
Purnea	5'47	3'77	9'24
Cooch Behar	0'50	5'25	5'75
Jalpaiguri	0'72	5'14	5'86
Rangpur	0'53	1'89	2'42
Dinajpur	1'17	2'34	3'51

The second storm formed at the head of the Bay on the 17th and 18th, and advanced through Chota Nagpur and South Bihar into the central districts of the North-Western Provinces. It gave a general moderate burst of rain to North-Eastern India, and the rainfall was more equally distributed than that of the preceding storm and characterized by the absence of cyclonic downpours.

The rainfall of the month was normal or in slight excess in Burma, Assam, the North-Western Provinces and North Bombay, in moderate defect in Orissa, and more or less considerably in excess in Bengal, Bihar and Chota Nagpur. The excess was very large in North Bengal, Sikkim and North Bihar.

The following gives comparative data for the larger provinces :—

AREA.	RAINFALL.			
	Average* actual, September 1898.	Average normal, September.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Burma	14'43	15'35	— 0'92	— 6
Assam	13'87	13'80	+ 0'07	+ 1
Bengal	14'82	11'04	+ 3'78	+ 34
Orissa	8'75	12'70	— 3'95	— 31

AREA.	RAINFALL.			
	Average actual, September 1898.	Average normal, September.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Bihar	19'63	8'12	+ 11'51	+ 142
Chota Nagpur	9'84	8'21	+ 1'63	+ 20
North-Western Provinces and Oudh. Punjab	7'55	6'57	+ 0'98	+ 15
Rajputana	1'94	2'57	— 0'63	— 25
Central India	2'30	2'69	— 0'39	— 14
Central Provinces	5'46	7'09	— 1'63	— 23
Berar	6'32	8'11	— 1'79	— 22
Gujarat	5'97	7'34	— 1'37	— 19
Kathiawar	7'58	8'03	— 0'45	— 6
Kathiawar	4'79	4'70	+ 0'09	+ 2
Konkan	20'42	14'96	+ 5'46	+ 36
Bombay Deccan	8'55	5'53	+ 3'02	+ 55
Madras	7'64	5'36	+ 2'28	+ 34

October.—The rainfall of this month in North-Eastern India forms part of the precipitation of the south-west monsoon proper, and is of great importance and value for the rice crops. In the Peninsula it belongs rather to the precipitation of the retreating south-west monsoon, and should be taken in consideration with the rainfall of November and December in estimating its value for the rice and other crops in Southern India and the Deccan. The rainfall for October is hence included in the estimates for the present period and the following period—the retreating south-west monsoon.

The Bombay current as a rain-giving current was much weaker than usual, and withdrew on the 30th September and 1st October from North Bombay, Berar, the Central Provinces and the Deccan and hence considerably earlier than usual as it had already done from North-Western India.

It gave moderate rain to the centre and south of the Peninsula from the 1st to the 8th, and again from the 22nd to the 31st. No rain fell over the Punjab, Rajputana, North Bombay and Central India, and the rainfall of the month was in large defect in the Central Provinces, Berar and the Deccan, and in slight to considerable excess in the south of the Peninsula.

Weather was less disturbed and more free from storms in the Bay than usual. One storm (of considerable intensity) formed in the centre of the Bay, and advanced to the Circars, where it recurved passing north-eastwards along the coast districts to South-West Bengal and thence into Central and North Bengal. It gave moderate to heavy rain in the districts through which it passed and also in Cachar and the Assam Hills. This was the last burst of rain in North-Eastern India received from the south-west monsoon of 1898, and the rains terminated in that area on the 16th.

The rainfall of the month was in excess in the areas passed over by that storm, *viz.*, North Madras, Orissa, Bengal and also Assam. It was scanty and more or less in defect in Chota Nagpur, Bihar and the North-Western Provinces, and in considerable to large defect over the greater part of Burma.

The following gives data showing the variations of the rainfall of the month from the normal in the larger provinces :—

AREA.	RAINFALL.			
	Average actual, October 1898.	Average normal, October.	Variation from normal.	Percentage variation from normal.
Burma	Inches. 4'72	Inches. 8'14	Inches. -3'42	- 42
Assam	6'27	4'91	+1'36	+ 28
Bengal	6'20	4'55	+1'65	+ 36
Bihar	1'04	2'74	-1'70	- 62
Chota Nagpur	2'02	2'92	-0'90	- 31
North-Western Provinces and Oudh	0'16	1'52	-1'36	- 89
Punjab	0	0'31	-0'31	-100
Rajputana	0	0'21	-0'21	-100
Central India	0'02	1'57	-1'55	- 99
Central Provinces	0'62	2'00	-1'38	- 69
Berar	0'28	2'49	-2'21	- 89
Gujarat	0	1'36	-1'36	-100
Kathiawar	0	0'69	-0'69	-100
Konkan	3'35	5'52	-2'17	- 39
Bombay Deccan	4'09	5'00	-0'91	- 18
Madras	8'19	7'34	+0'85	+ 12

The following gives the chief features of the distribution of rainfall for the whole monsoon period, June to September and also June to October, in India.

- (1) The rainfall of the period was in slight to moderate excess in the coast districts of Burma, as is shown below :—

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
Touasserim	Inches. 150'94	Inches. 139'14	Inches. +11'80	+ 8	Inches. 157'70	Inches. 150'02	Inches. +7'68	+ 5
Lower Burma	85'73	68'28	+17'45	+26	89'62	77'29	+12'33	+16
Arakan	155'61	144'38	+11'23	+ 8	161'01	154'08	+6'93	+ 4

- (2) It was on the mean of the whole period, June to October, in slight defect in the interior of Burma and in Cachar and the Assam Hills :—

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
Central Burma	Inches. 41'84	Inches. 44'66	Inches. -2'82	- 6	Inches. 44'71	Inches. 50'83	Inches. -6'12	-12
Upper „	30'28	32'05	-1'77	- 6	34'94	36'99	-2'05	- 6
Assam (Surma)	75'35	79'45	-4'10	- 5	81'17	85'31	-4'14	- 5
Assam Hills	90'80	101'43	-10'63	-10	101'69	109'25	-7'56	- 7

- (3) It was in slight to large excess over nearly the whole of the Gangetic Plain, Chota Nagpur, Bengal and the Assam Valley. The following gives comparative data :—

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
Assam (Brahmaputra)	Inches. 57'61	Inches. 57'25	Inches. +0'36	+ 1	Inches. 61'32	Inches. 61'21	Inches. +0'11	+ 5
Eastern Bengal	73'52	62'18	+11'34	+18	82'53	67'80	+14'73	+22
Deltaic „	45'63	43'16	+2'47	+ 8	53'60	47'67	+5'93	+12
Central „	52'05	42'84	+9'21	+21	56'98	46'35	+10'63	+23
North „	75'76	72'98	+2'78	+ 4	79'65	77'52	+2'13	+ 3
Chota Nagpur	50'50	44'57	+5'93	+13	52'52	47'49	+5'03	+11
South Bihar	49'81	37'20	+12'61	+34	50'93	39'82	+11'11	+28
North „	53'10	44'32	+8'78	+20	54'05	47'17	+6'88	+15
North-Western Provinces (East)	47'85	33'80	+14'05	+42	47'91	35'98	+11'93	+33
Oudh (South)	41'05	32'13	+8'92	+28	41'50	33'73	+7'77	+23
„ (North)	47'63	34'28	+13'35	+39	47'74	35'89	+11'85	+33
North-Western Provinces (Central)	39'56	31'53	+8'03	+25	39'79	32'57	+7'22	+22
North-Western Provinces (East Submontane)	52'91	36'73	+16'18	+44	53'07	39'60	+13'47	+34
North-Western Provinces (West Submontane)	41'76	40'24	+1'52	+ 4	41'84	41'07	+0'77	+ 2
North Western Provinces (Hills)	62'08	49'16	+12'92	+26	62'63	50'67	+11'96	+24

The excess was large, 33 per cent. or more, in Oudh North and the two eastern divisions of the North-Western Provinces.

- (4) The rainfall of the period was, relatively to the

normal, in moderate to large defect in Rajputana, the South and South-East Punjab and in slight defect in the west division of the North-Western Provinces, Central India, and the West, Central and Submontane Punjab and the Punjab Hills. The following gives comparative data —

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
South-East Punjab	Inches. 13'28	Inches. 20'40	Inches. - 7'12	-35	Inches. 13'28	Inches. 20'76	Inches. - 7'48	-36
South „	9'60	13'00	- 3'40	-26	9'60	13'21	- 3'61	-27
Central „	12'11	13'65	- 1'54	-11	12'11	14'00	- 1'89	-14
Punjab (Submontane).	22'54	24'05	- 1'51	- 6	22'54	20'43	- 1'89	- 9
Punjab (Hills)	42'45	44'53	- 2'08	- 5	42'51	45'43	- 2'92	- 6
West Punjab	5'44	6'15	- 0'71	-12	5'44	6'25	- 0'81	-13
North-Western Provinces (West).	20'42	23'52	- 3'10	-13	20'42	24'06	- 3'64	-15
Central India, (East).	36'68	39'38	- 2'70	- 7	36'70	40'95	- 4'25	-10
Rajputana (East) and Central India (West.)	17'27	25'85	- 8'58	-33	17'27	26'19	- 8'92	-34
Rajputana (West)	7'05	11'06	- 4'01	-36	7'05	11'13	- 4'08	-37

The deficiency was largest and most pronounced in Rajputana and the South-East Punjab, in which it was upwards of 30 per cent. below the normal.

(5) It was below the normal in Gujarat, Kathiawar, Khandesh, Berar and North Hyderabad. The following gives data in illustration :—

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
Gujarat	Inches. 42'50	Inches. 42'03	Inches. + 0'47	+ 1	Inches. 42'50	Inches. 43'39	Inches. - 0'89	- 2
Kathiawar	22'16	25'51	- 3'35	-13	22'16	26'20	- 4'04	-15
Khandesh	27'64	26'42	+ 1'22	+ 5	27'85	30'03	- 2'18	- 7
Berar	26'03	34'99	- 8'96	-26	26'31	37'48	-11'17	-30
Hyderabad (North)	26'77	29'78	- 3'01	-10	27'49	32'53	- 5'04	-15

The deficiency was most marked in Berar, in which it averaged 30 per cent.

(6) It was in slight excess in the central division of the Central Provinces, and normal or in slight

defect in South Hyderabad and the western and eastern districts of the Central Provinces :—

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
Central Provinces (West).	Inches. 39'97	Inches. 39'97	Inches. 0	0	Inches. 40'10	Inches. 42'05	Inches. -1'95	-5
Central Provinces (Central).	51'71	46'95	+ 4'76	+10	52'01	48'80	+ 3'21	+7
Central Provinces (East).	43'28	44'49	-1'21	- 3	44'72	46'55	-1'83	-4
Hyderabad (South).	24'74	22'36	+ 2'38	+11	25'96	25'43	+ 0'53	+2

(7) It was more or less considerably in excess over nearly the whole of the centre and south of the Peninsula, including Mysore, Madras (except the Madras Deccan or central division), the Bombay Deccan and Konkan, as is shown below :—

DIVISION.	RAINFALL OF PERIOD.							
	JUNE TO SEPTEMBER.				JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
Madras East Coast (North).	Inches. 26'54	Inches. 25'83	Inches. + 0'71	+ 3	Inches. 32'90	Inches. 31'59	Inches. + 1'31	+ 4
Madras (Central)	14'10	15'44	-1'34	- 9	15'92	20'99	-5'07	-24
Madras East Coast (Central).	10'51	10'77	-0'26	- 2	20'96	20'52	+ 0'44	+ 2
Madras East Coast (South).	16'76	15'33	+ 1'43	+ 9	26'95	23'67	+ 3'28	+14
Madras (South)	6'87	6'39	+ 0'48	+ 8	16'87	12'43	+ 4'44	+36
Mysore	24'32	20'47	+ 3'85	+19	29'88	25'99	+ 3'89	+15
Bombay Deccan	28'74	26'86	+ 1'88	+ 7	32'83	31'86	+ 0'97	+ 3
Konkan	116'01	106'10	+ 9'91	+ 9	119'36	111'62	+ 7'74	+ 7

(8) The rainfall of the period, June to October, was below the normal in 26 out of the 57 meteorological or rainfall divisions. The deficiency was small in amount in the majority of these

divisions, but exceeded 25 per cent. in the divisions for which comparative data are given below :—

DIVISION.	RAINFALL OF PERIOD.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
South-East Punjab . . .	13'28	20'76	- 7'48	-36
South Punjab . . .	9'60	13'21	- 3'61	-27
Rajputana (East) and Central India (West). . .	17'27	26'19	- 8'92	-34
Rajputana (West) . . .	7'05	11'13	- 4'08	-37
Berar	26'31	37'48	-11'17	-30

(9) The rainfall of the period, June to October, was above the normal in 31 rainfall divisions and was more than 25 per cent. in excess in five divisions, for which comparative data are given in the following table :—

DIVISION.	RAINFALL OF PERIOD.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
South Bihar	50'93	39'82	+11'11	+28
North-Western Provinces (East).	47'91	35'98	+11'93	+33
Oudh (North)	47'74	35'89	+11'85	+33
N.-W.-P. (East Submontane).	53'07	39'60	+13'47	+34
Madras (South)	16'87	12'43	+ 4'44	+36

IV. The retreating south-west monsoon period.—The monsoon currents, as already stated, withdrew from Upper India in the third week of September and from Bengal, Burma and the Deccan in the third or fourth week of October.

The humid south-west current in the Bay was chiefly determined in the last week of October, and in November and December by the pressure conditions to the south-west of the Bay, the Coromandel Coast districts and South India. The chief feature of the period was the comparative absence of cyclonic storms. A small cyclone of moderate intensity passed west-north-westwards in the second week of October from the centre of the Bay to the Circars coast, where it recurved and passed along the eastern flank of the East Ghats through Ganjam and Orissa into South-West and Central Bengal, and filled up in North Bengal on the 16th October. A cyclonic storm of moderate intensity advanced across the centre of the Bay to the Madras Coast in the first week of November, and was followed by light to moderate general rain over the centre and south of the Peninsula from the 5th to

the 16th of the month. Finally, a diffused cyclonic disturbance formed in the south of the Bay on the 27th December, and advanced westwards across North Ceylon and the southern districts of Madras. It gave a heavy burst of rain in South Madras and Ceylon.

A cold weather storm of moderate intensity affected Upper India in the last week of December. It gave light to moderate rain in the Punjab and moderate to heavy snow in the Kashmir and Punjab Himalayas.

The rains practically ceased in Burma during the fourth week of October.

The following is a summary of the more important features of the rainfall of the period :—

(1) The rainfall of the period was in serious defect in Burma. The deficiency was considerable to large in actual amount in October. The deficiency, although small to moderate in actual amount in November and December, was large relatively to the normal fall of the period :—

DIVISION.	VARIATION OF RAINFALL FROM NORMAL DURING				
	October 1898.	November 1898.	December 1898.	Total of period, October to December 1898.	Percentage variation from normal of period.
	Inches.	Inches.	Inch.	Inches.	
Tenasserim	-5'41	-1'34	0	-6'75	-35
Lower Burma	-4'24	-3'58	-0'24	-8'06	-70
Central „	-3'81	-1'93	-0'14	-5'88	-65
Upper „	+0'11	-1'48	-0'66	-2'03	-35
Arakan	-2'85	-3'63	-0'32	-6'80	-61

(2) The rainfall of the period was in slight to moderate excess in Orissa, Bengal (excepting the northern districts) and the Assam Valley, chiefly due to the precipitation accompanying the storm of the second and third weeks of October. It was, on the other hand, in slight defect in Cachar and North Bengal. The following gives data :—

DIVISION.	VARIATION OF RAINFALL FROM NORMAL DURING				
	October 1898.	November 1898.	December 1898.	Total of period, October to December 1898.	Percentage variation from normal of period.
	Inches.	Inches.	Inch.	Inches.	
Orissa	+3'29	-2'07	-0'06	+1'16	+14
Eastern Bengal	+3'39	-1'33	-0'19	+1'87	+26
Deltaic „	+2'46	-0'91	-0'09	+1'46	+26
Central „	+1'42	-0'57	-0'10	+0'75	+18
North „	-0'65	-0'03	-0'07	-0'75	-16
Assam (Serma)	-0'04	-0'81	-0'63	-1'48	-20
„ (Brahmaputra)	+2'75	-0'33	+0'42	+2'84	+37

(3) The rainfall of the period was below the normal in the North-Western Provinces, Central India, Rajputana, the Punjab and Sind. The deficiency was considerable in the North-Western Provinces and Central India due to the absence of rain in October. The following gives data :—

AREA.	VARIATION OF RAINFALL FROM NORMAL IN				
	October 1898.	November 1898.	December 1898.	Total of period, October to December 1898.	Percentage variation from normal of period.
	Inches.	Inch.	Inch.	Inches.	
North-Western Provinces and Oudh.	—1'37	+0'06	+0'02	—1'29	—67
Central India	—1'55	—0'34	—0'11	—2'00	—87
Rajputana	—0'21	—0'16	+0'24	—0'13	—22
Punjab	—0'31	—0'21	+0'25	—0'27	—31
Sind	—0'03	—0'07	—0'08	—0'18	—86

(4) The rainfall was in large and serious defect in North Bombay, Berar, the Central Provinces, the Konkan and the Deccan. This deficiency was due to the early withdrawal of the monsoon currents from these areas :—

DIVISION.	VARIATION OF RAINFALL FROM NORMAL IN				
	October 1898.	November 1898.	December 1898.	Total of period, October to December 1898.	Percentage variation from normal of period.
	Inches.	Inch.	Inch.	Inches.	
Berar	—2'21	—0'52	—0'54	—3'27	—89
Central Provinces	—1'37	—0'40	—0'30	—2'07	—74
Khandesh	—3'40	—0'52	—0'34	—4'26	—84
Gujarat	—1'36	—0'11	+0'12	—1'35	—84
Kathiawar	—0'69	—0'26	+0'24	—0'71	—67
Konkan	—2'17	+0'55	—0'02	—1'64	—24
Bombay (Deccan)	—0'91	—0'04	—0'26	—1'21	—18
Hyderabad	—1'94	+0'06	—0'45	—2'33	—51

(5). The rainfall of the period was throughout in excess over the greater part of Madras and in Mysore, as is shown below :—

DIVISION.	VARIATION OF RAINFALL FROM NORMAL IN				
	October 1898.	November 1898.	December 1898.	Total of period, October to December 1898.	Percentage variation from normal of period.
	Inches.	Inches.	Inches.	Inches.	
Malabar	+1'97	+2'23	—0'41	+3'79	+26
Madras (South)	+3'96	+1'66	+1'15	+6'77	+42
„ (East Coast, South)	+1'85	+9'78	+3'91	+15'54	+70
„ (East Coast, Central)	+0'70	+3'06	+0'35	+4'11	+19
„ (East Coast, North)	+0'60	+1'31	—0'94	+0'97	+10
„ (Central)	—3'73	+1'33	+0'34	—2'06	—25
Mysore	+0'04	+4'01	—0'39	+3'66	+42

The rainfall was in some cases very heavy. The following gives the most noteworthy falls :—

PROVINCE.	DISTRICT.	STATION.	DATE.	Rainfall during 24 hours preceding 8 A.M. of
				Inches.
MADRAS .	Ganjam . .	Rambah . .	11th October 1898	8'05
„	„	Sompert . .	13th „ „	10'21
BENGAL .	24-Parganas .	Saugor Island .	12th „ „	9'71
„	Faridpur .	Faridpur . .	13th „ „	11'36
„	Backergunge .	Bauphal . .	14th „ „	9'26
„	Mymensingh .	Durgapur . .	15th „ „	10'50
MADRAS .	South Arcot .	Cuddalore . .	6th November „	8'94
„	„	Vanur . .	„ „ „	8'80
„	„	Manambadi .	„ „ „	8'63
„	Nellore . .	Kandukar . .	7th „ „	10'36
„	Godavari .	Razole . .	8th „ „	10'13
„	„	Narsapuram .	„ „ „	8'45
„	Nellore . .	Rapur . .	1st December „	11'01
„	Cuddapah .	Chitvel . .	„ „ „	8'40

Year.—The following is a brief statement of the variation of the rainfall of the year from the normal.

The rainfall of the year averaged 0'43 inch above the normal for the whole of India.

The rainfall was in defect over the areas including Central and Upper Burma, Arakan, Assam, North Bengal, Sikkim, Orissa, the North-Western Provinces (West), nearly

the whole of the Punjab, Rajputana, Central India, North Hyderabad, Berar, Khandesh, the Central Provinces (West and East), Kathiawar, Sind, Baluchistan, Malabar and Central and North Madras. The following gives comparative data for the rainfall divisions in these areas in which the rainfall was less than 10 per cent. in defect :—

DIVISION.	AVERAGE TOTAL RAINFALL DURING THE YEAR.			
	Actual, 1898.	Normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Arakan	167'86	178'04	—10'18	—6
Assam (Brahmaputra) . . .	87'91	88'82	—0'91	—1
Bengal (Hills)	126'29	138'14	—11'85	—9
North-Western Provinces (West)	25'56	26'33	—0'77	—3
Punjab (West)	8'08	8'89	—0'81	—9
„ (Submontane)	30'48	30'77	—0'29	—1
„ (Central)	17'20	18'88	—1'68	—9
Malabar	125'59	127'12	—1'53	—1
Central Provinces (West) . .	41'64	44'65	—3'01	—7
„ (East)	47'14	50'08	—2'94	—6
Sind	5'53	5'99	—0'46	—8
Central India (East)	39'52	43'42	—3'90	—9

The rainfall was between 10 and 25 per cent. in defect in 10 rainfall divisions in those areas, as shown below :—

DIVISION.	AVERAGE TOTAL RAINFALL DURING THE YEAR.			
	Actual, 1898.	Normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Central Burma	51'16	59'11	—7'95	—13
Upper Burma	41'24	45'67	—4'43	—10
Assam Hills	117'72	138'18	—20'46	—15
Orissa	54'68	61'77	—7'09	—11
South Punjab	13'41	16'02	—2'61	—16
Punjab Hills	54'57	62'01	—7'44	—12
Hyderabad (North)	30'59	36'18	—5'59	—15
Khandesh	29'18	32'87	—3'69	—11
Kathiawar	12'30	27'08	—14'78	—54
Madras (Central)	23'43	26'30	—2'87	—11

The rainfall was between 25 and 50 per cent. in defect in the six divisions for which data are given below :—

DIVISION.	AVERAGE TOTAL RAINFALL DURING THE YEAR.			
	Actual, 1898.	Normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Assam (Surma)	93'65	126'83	—33'18	—26
South-East Punjab	17'49	23'54	—6'05	—26
Berar	27'50	40'56	—13'06	—32
Baluchistan	4'95	9'50	—4'55	—48
Rajputana (East) and Central India (West).	19'79	28'16	—8'37	—30
West Rajputana	8'34	12'53	—4'19	—33

The rainfall was in excess in the remainder of India, including 26 rainfall divisions or areas:—

1st.—The following gives comparative data for 12 of these divisions in which the rainfall was between 1 and 10 per cent. in excess :—

DIVISION.	AVERAGE TOTAL RAINFALL DURING THE YEAR.			
	Actual, 1898.	Normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Tenasserim	189'27	172'95	+16'32	+9
Eastern Bengal	92'98	88'06	+4'92	+6
Deltaic Bengal	62'40	60'58	+1'82	+3
Chota Nagpur	56'05	53'63	+2'42	+5
North-Western Provinces (West Submontane.)	49'12	46'29	+2'83	+6
North Punjab	21'64	21'27	+0'37	+2
Konkan	123'13	115'06	+8'07	+7
Bombay (Deccan)	38'60	36'59	+2'01	+6
Central Provinces (Central.)	55'21	51'51	+3'70	+7
East Coast (North)	41'17	39'57	+1'60	+4
Hyderabad (South)	30'11	29'38	+0'73	+2
East Coast (Central)	38'22	35'19	+3'03	+9

2nd.—The following gives data for the eight divisions in which the rainfall was between 10 and 25 per cent. in excess :—

DIVISION.	AVERAGE TOTAL RAINFALL DURING THE YEAR.			
	Actual, 1898.	Normal.	Variation from normal	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Lower Burma . . .	104'92	93'71	+ 11'21	+ 12
Central Bengal . . .	63'32	56'07	+ 7'25	+ 13
South Bihar . . .	53'65	43'88	+ 9'77	+ 22
North Bihar . . .	59'91	52'95	+ 6'96	+ 13
South Oudh . . .	44'39	36'10	+ 8'29	+ 23
North-Western Provinces (Central).	42'71	34'47	+ 8'24	+ 24
Mysore . . .	42'23	34'48	+ 7'75	+ 22
North-Western Provinces (Hills).	73'18	61'18	+ 12'00	+ 20

3rd.—The following gives data for the six divisions in which the excess was between 25 and 40 per cent :—

DIVISION.	AVERAGE TOTAL RAINFALL DURING THE YEAR.			
	Actual, 1898.	Normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
North-Western Provinces (East).	50'06	38'25	+ 11'81	+ 31
North Oudh . . .	51'73	38'95	+ 12'78	+ 33
North-Western Provinces (East Submontane).	56'23	42'63	+ 13'60	+ 32
Madras (South Central)	37'83	29'59	+ 8'24	+ 28
Madras East Coast (South)	57'87	42'42	+ 15'45	+ 36
Madras (South)	37'11	28'87	+ 8'24	+ 29

The following gives a statement of the variation of the mean rainfall of India (excluding Burma) during the past 24 years :—

YEAR.	NUMBER OF DIVISIONS.			RAINFALL.			
	Fall, excessive.	Fall, normal.	Fall, deficient.	Average actual.	Average normal.	Variation from normal	Percentage variation from normal.
				Inches.	Inches.	Inches.	
1875 . . .	16	...	8	43'47	41'09	+ 2'38	+ 6
1876 . . .	6	...	18	36'60	41'09	- 4'49	- 11
1877 . . .	10	...	14	36'81	41'09	- 4'28	- 10
1878 . . .	17	1	6	47'43	41'09	+ 6'34	+ 15
1879 . . .	16	2	6	42'78	41'09	+ 1'69	+ 4
1880 . . .	13	1	10	39'53	41'09	- 1'56	- 4
1881 . . .	15	...	9	41'19	41'09	+ 0'10	0
1882 . . .	17	1	6	43'73	41'09	+ 2'64	+ 6
1883 . . .	11	1	12	40'97	41'09	- 0'12	0
1884 . . .	12	...	10	42'82	41'09	+ 1'73	+ 4
1885 . . .	15	...	7	42'14	41'09	+ 1'05	+ 3
1886 . . .	14	...	8	44'11	41'09	+ 3'02	+ 7
1887 . . .	11	...	11	43'51	41'09	+ 2'42	+ 6
1888 . . .	10	...	12	39'55	41'09	- 1'54	- 4
1889 . . .	15	...	8	43'50	41'09	+ 2'41	+ 6
1890 . . .	14	1	8	41'77	41'09	+ 0'68	+ 2
1891 . . .	6	...	17	37'55	41'09	- 3'54	- 9
1892 . . .	15	...	8	46'18	41'09	+ 5'09	+ 12
1893 . . .	22	...	1	50'16	41'09	+ 9'07	+ 22
1894 . . .	17	...	6	47'56	41'09	+ 6'47	+ 16
1895 . . .	5	...	17	38'90	41'09	- 2'19	- 7
1896 . . .	7	2	14	36'26	41'09	- 4'83	- 12
1897 . . .	10	2	11	40'94	41'09	- 0'15	0
1898 . . .	10	3	10	41'52	41'09	+ 0'43	+ 1

Concluding Summary.

I.—Cold Weather Period, January and February 1898.—The following table gives mean variation data of the more important meteorological elements for the cold weather period, January and February 1898:—

METEOROLOGICAL PROVINCE.	JANUARY AND FEBRUARY 1898.						
	Variation from normal of mean monthly pressure.	Variation from normal of mean maximum temperature.	Variation from normal of mean minimum temperature.	Variation from normal of mean aqueous vapour pressure.	Variation from normal of mean relative humidity.	Variation from normal of mean cloud amount.	Total variation from normal of average actual rainfall.
	"	°	°	"			Inches.
Burma Coast and Bay Islands.	—'041	—0'2	+1'3	+0'02	—1	+0'6	+0'35
Burma Inland . . .	—'036	+0'5	+1'6	?	?	?	—0'12
Assam	—'032	+0'5	—0'1	—'001	—1	+0'1	—0'72
Bengal and Orissa .	—'034	—0'5	—0'6	—'027	—4	—0'6	—0'37
Gangetic Plain and Chota Nagpur.	—'035	0	0	+0'14	+2	—0'9	+0'47
Upper Sub-Himalayas .	—'040	+0'9	+1'3	—'011	—4	—1'0	+1'87
Indus Valley and North-West Rajputana.	—'050	+3'2	+1'6	+0'09	—3	—1'2	+0'43
East Rajputana, Central India and Gujarat.	—'032	+1'7	+0'4	—'003	—1	—1'3	+0'38
Deccan	—'014	—0'7	—2'0	—'061	—6	—0'9	+0'77
West Coast	—'024	+0'8	—0'1	—'047	—6	—0'3	+0'09
South India	—'022	—0'3	—0'2	—'029	—3	0	+0'17

The pressure variations were slight to moderate in amount. Pressure was below the normal over the whole of India. The deficiency was greatest in Burma and Upper India and least in the Deccan. In other words, relatively to the general condition, pressure was in moderate local defect in Burma and Upper India, and in moderate local excess in the Deccan and slight excess in Southern India and the West Coast. These local variations were directly related to the temperature variations, the local pressure defect in Upper India and Burma accompanying a moderate excess of temperature averaging nearly $2\frac{1}{2}^{\circ}$ in the former area and 1° in the latter and the pressure excess in the Deccan to a moderate deficiency of temperature ($-1\frac{1}{2}^{\circ}$).

The mean maximum temperature of the period was in general excess in India by amounts averaging $0^{\circ}5$ for the whole area. The excess was most marked in the Indus Valley and North-West Rajputana, where it was $3^{\circ}2$ in average amount. The mean minimum temperature of the period was generally in excess in Northern and Central India, and in defect in the centre, south and west of the

Peninsula, but by smaller amounts than the day temperature.

The air contained less aqueous vapour than usual over the whole of India, except Upper India and the Gangetic Plain. The deficiency was greatest in the Deccan and West Coast. In consequence of the deficiency being combined with the prevailing high temperature conditions, humidity was below the normal in all divisions, except the Gangetic Plain. The decreased humidity was most marked in the Deccan and West Coast. There was also less cloud than usual over the whole area, except Assam, Burma and South India. The rainfall of the period was more or less in excess over the whole of India, with the exception of Assam, Bengal, Orissa and Burma Inland, in which areas it was in slight to moderate defect.

The chief features of the cold weather season were the prevalence of less disturbed weather than usual in January and the occurrence of a series of storms of unusual character in February.

A reference to the monthly weather summaries for the year 1898 will show that there was a considerable resemblance between the cold weather period of that year and those of the years 1892, 1896 and 1897. These periods were all marked by a considerable excess of temperature and by decreased humidity and cloud in North-Western India. The following gives comparative data for the cold weather periods of the years 1892 to 1898 for the area including the Punjab, Rajputana, the North-Western Provinces and Bihar:—

COLD WEATHER PERIOD OF	VARIATION FROM NORMAL IN NORTH-WESTERN INDIA OF			
	Temperature.	Humidity.	Cloud.	Rainfall.
	°			Inches.
1898	+1'1	—1	—1'0	+1'22
1897	+1'2	—2	—0'4	—0'12
1896	+2'0	—3	—0'5	—0'72
1895	+0'8	+5	—0'2	+0'43
1894	+0'6	+10	+1'3	+0'92
1893	—4'2	+11	+1'4	+2'04
1892	+2'5	—2	—0'2	—0'37

The variations of the temperature and humidity conditions in the cold weather of 1897-98 were determined by the distribution of the rainfall during the period, and hence by the distribution and character of the cold weather storms of December 1897 and of January and February

1898. The chief characteristics of the storms of that period were as follows :—

(1) The number of depressions and cold weather disturbances was less than the normal.

(2) The disturbances were (with one exception) feeble and ill-defined, and did not give rise to deep secondary depressions in the Punjab.

(3) The precipitation accompanying these disturbances in the Afghan and Himalayan areas fell as rain to much higher levels than in normal cold weather periods.

(4) The precipitation accompanying these disturbances in January and the latter half of February was practically restricted to Upper India.

(5) The chief rainfall of the period occurred during a disturbance of unusual character and rare occurrence in the cold weather. This disturbance originated in Kathiawar and Gujarat, and was followed by a prolonged diffused disturbance over nearly the whole of India from the 9th to the 18th February. A similar storm occurred in February 1889 and is the only other example during the past 25 years of a rainfall storm originating in that area in the cold weather.

The preceding remarks indicate that the chief features of the cold weather storms of 1897-98 were persistent throughout the season.

An examination of the pressure and other conditions obtaining in India before and during the cold weather periods of these two years throws little or no light on the abnormal features of these storms, and hence suggests that they were related either to conditions in the upper atmosphere over Northern India, or to conditions outside of India.

The following table gives vertical pressure anomalies for the cold weather period of 1897-98 :—

PAIR OF STATIONS.	VERTICAL PRESSURE ANOMALY.						
	September 1897.	October 1897.	November 1897.	December 1897.	January 1898.	February 1898.	Mean of period, November 1897 to February 1898.
Leh and Lahore .	?	?	+ '120	— '022	+ '052	+ '009	+ '040
Quetta and Jacobabad	+ '005	+ '019	+ '057	+ '010	+ '083	+ '052	+ '050
Murree and Peshawar	+ '021	+ '040	+ '056	+ '011	+ '044	+ '054	+ '041
Simla and Ludhiana .	+ '005	+ '019	+ '025	— '007	+ '036	+ '022	+ '019
Chakrata and Roorkee	+ '016	+ '046	+ '041	+ '007	+ '042	+ '022	+ '028
Ranikhet and Bareilly	+ '002	+ '027	+ '028	+ '007	+ '022	+ '017	+ '018
Darjeeling and Dhubri	— '030	+ '021	+ '002	?	+ '042	+ '057	?
Mount Abu and Deesa	— '004	— '019	— '019	— '013	+ '023	0	— '002
Pachmarhi and Hoshangabad.	+ '002	— '016	— '017	— '008	— '026	— '017	— '017

The following table gives the mean vertical pressure anomalies for the cold weather periods of the past seven years for comparison :—

PAIR OF STATIONS.	VERTICAL PRESSURE ANOMALY.						
	1897-98.	1896-97.	1895-96.	1894-95.	1893-94.	1892-93.	1891-92.
	"	"	"	"	"	"	"
Leh and Lahore .	+ '040	+ '013	+ '041	+ '009	— '004	— '046	+ '040
Quetta and Jacobabad	+ '050	— '007	+ '019	+ '001	+ '006	— '007	+ '063
Murree and Peshawar .	+ '041	+ '006	+ '022	— '006	?	?	?
Simla and Ludhiana .	+ '019	— '003	+ '012	— '017	— '015	— '049	+ '017
Chakrata and Roorkee	+ '028	+ '023	+ '030	+ '010	— '010	— '022	+ '039
Ranikhet and Bareilly.	+ '018	+ '021	+ '025	+ '003	+ '011	+ '013	+ '030
Darjeeling and Dhubri	?	+ '004	+ '007	+ '001	+ '017	— '008	+ '026
Mount Abu and Deesa	— '002	— '008	+ '005	— '007	+ '003	?	+ '027
Pachmarhi and Hoshangabad.	— '017	+ '013	?	+ '013	?	+ '005	+ '024

The preceding data show that in the cold weather of 1897-98, as in those of 1895-96 and 1891-92, the vertical pressure anomalies were positive and moderate to considerable in amount, indicating increased pressure in the middle atmospheric strata relatively to the lower strata. This feature was slightly exhibited in September, and was remarkably persistent throughout the whole cool weather period from October to February. The relative excess of pressure was moderate in October and December 1897, and moderately large in January and February 1898.

The rainfall of the cold weather seasons of 1891-92 and 1895-96 in Upper India was below the normal.

The rainfall of the cold weather of 1897-98 was, on the other hand, considerably above the normal in Northern and Central India. This was, however, solely due to the heavy precipitation accompanying the abnormal disturbance of the second week of February. The characteristic feature of the season was its dryness and scanty rainfall in the latter part of December 1897 and in January 1898, months in which rainfall is usually received in North-Western India. If the rainfall of the abnormal disturbance in February be disregarded, the cold weather season of 1897-98 was one of scanty rainfall. The meteorology of the cold weather of 1897-98 is hence in accordance with, and confirms the conclusions given in, page 574 of the Annual Summary for the year 1893.

An examination of the Indian monsoon area charts and of the charts in the weekly weather reports issued by the English Meteorological Office indicates the conditions which obtained in Europe during the inception of the storms of the period.

The following table gives a list of the more important

cold weather storms of 1897-98 and of the conditions obtaining in South-East and South Europe during their formation :—

Date and character of storm.	Area of formation.	Weather conditions in East, South-East and South Europe prior to and during formation of storm.
Cold weather storm of the 28th to the 30th December 1897 in Persia and the 1st to the 5th January in Baluchistan and Northern India	West Persia . .	Well marked high pressure conditions obtained in Southern, Central and Eastern Europe from the 24th to the 31st December.
Cold weather storm of the 27th to the 30th January in Persia and the 31st January to the 4th February in Baluchistan and Northern India.	Persia	A depression lay over Central Russia on the 23rd and 24th. It was displaced southwards to the Black Sea on the 25th and 26th, filling up considerably at the same time, and eastwards to the Caspian Sea on the 27th as a shallow residual disturbance.
Feeble cold weather storm of the 3rd to the 6th February in Northern India.	Upper India . .	Anti-cyclonic conditions prevailed over South and South-East Europe during the period from the 28th January to the 4th February.
Cold weather storm of the 8th to the 12th February.	North Bombay and South-West Rajputana.	
Disturbance of the 15th to the 20th February.	Sind	High pressure conditions obtained in South-East Europe from the 11th to 17th February.
Cold weather storm of the 25th to the 27th February in Persia and the 28th February to the 4th of March in Baluchistan and Northern India.	West Persia . .	Anti-cyclonic conditions held steadily in East and South-East Europe from the 19th to the end of February. A cyclonic storm affected the Central Mediterranean from the 24th to the 26th.

The preceding data indicate clearly that the cold weather storms of 1897-98 in India were not the continuation of European storms, and that anti-cyclonic conditions prevailed to the north and north-west of Baluchistan or Persia during their initiation.

The preceding discussion has shown that the scanty rainfall during the greater part of the cold weather of 1897-98 was associated, as in years of similar conditions, with certain pressure conditions in the middle and probably the higher atmospheric strata. I have in my memoir on "The Cold Weather Storms in India during the years 1876-91" and elsewhere suggested that there is probably not only a direct relation between the winter precipitation of North-Western India, Baluchistan and Persia, but that it is dependent in some way upon the position and stability of the winter anti-cyclone in Russia and Central Asia. The cold weather rainfall has been below the normal in North-Western India during the period from 1895-96 to 1897-98. The same was the case in the cold weather of the present year (1898-99), which may hence be added to the group of years of deficient winter rains in North-Western India. The following data will show that the deficiency has been very marked in Baluchistan and Persia so far as is indicated by the available data :—

STATION.	RAINFALL OF PERIOD, DECEMBER TO FEBRUARY.					
	Normal rainfall of period.	Variation from normal in				
		1891-92.	1895-96.	1896-97.	1897-98.	1898-99.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Baghdad	6'03	-1'33	+0'51	-2'78	-2'10	-4'50
Teheran	3'49	?	-0'68	+0'89	-1'03	-0'58
Ispahan	0'60	?	-0'15	+0'08	+1'07	+0'09
Bushire	9'11	-5'80	-6'33	-3'49	-6'86	-4'30
Jask	2'47	?	-1'34	-0'80	-2'36	-1'97
Quetta	5'05	-3'21	+0'34	-0'77	-2'30	-2'68
Kashgar	0'82	?	-0'74	-0'20	-0'82	-0'82
Kalat	5'11	?	...	-2'30	-3'37	-2'93
Chaman	4'63	?	-2'26	-0'05	-3'03	-1'39
Kabul	1'85	?	-1'85	+4'95	-1'47	-1'85
Punjab	2'22	-1'47	-0'59	+0'17	+1'63	-0'83
Rajputana . . .	0'78	0	-0'38	-0'27	+0'24	-0'32
Sind	0'82	-0'63	-0'53	-0'65	-0'20	-0'78
North-Western Provinces and Oudh.	1'52	-0'43	-1'05	+0'21	+1'26	-0'26

STATION.	RAINFALL OF PERIOD, OCTOBER TO MARCH.					
	Normal rainfall of period.	VARIATION FROM NORMAL IN				
		1891-92.	1895-96.	1896-97.	1897-98.	1898-99.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
Baghdad	9'03	-2'66	+2'61	-5'03	-3'18	-6'25
Teheran	7'73	?	-0'52	+0'99	-0'67	-3'33
Ispahan	3'27	?	+0'85	-1'73	-0'26	-1'65
Bushire	12'24	-4'56	-7'67	-4'49	-5'30	-4'76
Jask	4'35	?	-0'73	-2'11	-1'91	-2'96
Quetta	7'07	-4'15	+1'74	-0'45	-0'76	-2'49
Kashgar	1'18	?	-0'61	-0'50	?	-1'18
Kalat	7'08	?	?	-3'08	-3'07	-4'67
Chaman	6'59	?	-2'39	-0'03	-2'96	-2'17
Kabul	8'73	?	+2'27	+2'60	-4'30	-4'58

The data of the two preceding tables show conclusively that the winter rainfall and precipitation of the cold weather of 1897-98 was even more largely in defect in Asiatic Turkey, Persia, Baluchistan and probably Afghanistan than in North-Western India and the Western Himalayas. They also indicate that in the very dry winter of 1891-92 the deficiency was also as marked in these areas as in North-Western India. The facts hence point strongly to the conclusion that deficient cold weather rainfall in North-Western India is not a local incident, but is associated with deficiency over the large area

to the west of Northern India, including Persia, Baluchistan and Asiatic Turkey, and hence that it is not due to abnormal conditions affecting North-Western India only, but to conditions of a much more general character. An examination of the English and Russian charts of the past two years indicates that the winter anti-cyclone usually in Central Russia and South-East Europe was much further south than usual, and was remarkably persistent in its abnormal position. It hence appears to be probable that deficient winter rainfall in the Persian area and North-Western India is associated with anomalous features in the position, extent and intensity of the winter anti-cyclones of South-Eastern Europe. It is possible that the present drought and famine in Russia may be a result of the same abnormal and persistent meteorological conditions. It is to be regretted that there is no systematic general early publication of the abnormal features of each month and season of the meteorology of Europe, as it is probable they would throw much light on such important questions as that under discussion, *vis.*, the variation of the winter or cold weather precipitation in the Persian area and North-Western India, and thus perhaps tend to a further improvement in the forecasting of the winter rains in Northern India.

II. Hot weather, March to May 1898.—The following table gives the mean variations of the more important meteorological elements in the eleven meteorological provinces of India for the hot weather period, March to May 1898:—

METEOROLOGICAL PROVINCE.	HOT WEATHER PERIOD, 1898.						
	Variation from normal of mean pressure.	Variation from normal of mean maximum temperature.	Variation from normal of mean minimum temperature.	Variation from normal of aqueous vapour pressure.	Variation from normal of mean relative humidity.	Variation from normal of cloud amount.	Variation of average actual rainfall of period from normal.
Burma Coast and Bay Inlands.	-.030	-0.5	+0.5	+.003	+1	-0.1	Inches. +7.08
Burma Inland . . .	-.018	+1.5	+0.4	...	...	...	-0.71
Assam	-.019	+2.7	+0.1	-.019	-6	-0.9	-12.99
Bengal and Orissa . .	-.015	+1.4	-0.4	-.031	-4	-0.9	-3.59
Gangetic Plain and Chota Nagpur	-.018	+1.9	+0.4	+.004	-2	-1.1	-0.67
Upper Sub-Himalayas	-.013	+1.3	+0.8	-.049	-6	-0.2	-1.54
Indus Valley and North-West Rajputana.	-.011	+1.5	+0.8	-.031	-6	-0.2	-0.34
East Rajputana, Central India and Gujarat.	-.005	+1.7	+1.1	-.029	-5	-0.5	-0.34
Deccan	-.005	+1.6	+1.6	-.028	-4	-0.2	-0.75
West Coast	-.011	+1.0	+0.9	-.003	-3	-0.4	-2.42
South India	-.013	+0.8	-0.2	-.022	-2	-0.3	-1.00

The previous table gives mean data for the whole

period, and indicates that on the average of the period pressure was in slight defect, temperature generally in slight excess, humidity slightly to considerably below the normal and cloud and rainfall more or less below the normal. The mean pressure of the Indian land area was .013" in defect in March, .017" in defect in April and .009" in defect in May, and hence averaged .013" in defect for the hot weather period. Series of thunderstorms occurred at intervals in March and April in the Punjab, North-Eastern India and Southern India, but the precipitation was in general defect in the first two areas. Temperature was generally normal or below it in March and more or less above the normal in April. The excess was large and pronounced in Northern and Central India in April. The local variations of pressure from the general conditions in these months were small and apparently of little importance. The chief feature of the meteorology of May was a disturbance in the second week of the month, which gave moderately heavy snow over the whole of the interior ranges of the Western Himalayas. It was followed by a cool wave of considerable intensity in May. The remainder of the month of May was considerably hotter than usual over the whole of Northern and Central India, and temperature was on the mean of the month in general excess. The excess was small to moderate in amount and was most marked in Upper Sind, North-West Rajputana and the South-West Punjab, and also in Cachar. The hot weather conditions of May gave rise to the following abnormal features of the pressure distribution in that month:—

(1) General deficiency, relatively to the mean condition, over the whole of North-Eastern India and Burma, the deficiency being most marked in Tenasserim and the Andaman Sea.

(2) General excess of pressure in the Peninsula and Upper India, greatest in the west coast districts from Kathiawar to North Malabar and in Sind.

(3) Excess of pressure at the level of the hill stations as compared with the neighbouring plains:

It is interesting to compare the meteorology of May 1898 with the meteorology of the corresponding months of the years 1879, 1880, 1890, 1892, 1894, 1895 and 1897. The winter snowfall of these years was (with the exception of the year 1894) considerably or largely in defect and (with two exceptions) the hot weather characterized by excessive temperature, more especially in May. The following gives data showing the variations of the mean pressure, temperature and aqueous vapour amount

(as measured by its pressure) of the whole of India from the normal in this month :—

MONTH AND YEAR.	VARIATION FROM NORMAL OF		
	Mean pressure of month.	Mean temperature of month.	Mean aqueous vapour pressure of month.
May 1879	—'045	+1'3	—'010
" 1880	—'022	+0'2	—'001
" 1890	—'022	+0'6	—'011
" 1892	—'027	+1'8	—'002
" 1894	—'023	+1'5	—'011
" 1895	—'007	+2'4	+ '027
" 1896	+ '013	+2'3	—'005
" 1897	—'004	+1'7	—'005
" 1898	—'008	+0'6	—'011

The following gives mean temperature variation data of Northern India (including the Punjab, Upper Sind, the North-Western Provinces, Bihar and Rajputana) for the month of May of eleven years resembling May 1898 in their chief features :—

MONTH AND YEAR.	Variation of mean temperature in Northern India.	Area of greatest variation.	Amount of greatest variation.
May 1879	+4'0	North-Western Provinces	+5'0
" 1880	+2'0	South Punjab . . .	+5'6
" 1881	+0'8	Do.	+2'9
" 1882	—0'5	North Punjab . . .	+2'1
" 1890	+1'5	Punjab	+2'5
" 1892	+3'0	West Punjab . . .	+5'5
" 1894	+3'0	Chota Nagpur . . .	+5'0
" 1895	+4'0	Punjab	+6'0
" 1896	+3'1	Do.	+4'8
" 1897	+3'6	North-West Rajputana.	+5'5
" 1898	+0'8	Assam (Surma) . . .	+3'6

The data of the preceding table show that the temperature conditions of May 1881, 1882 and 1898 were practically normal. In each of the months of May 1879, 1880, 1890, 1892, 1894, 1895, 1896 and 1897 temperature was considerably above the normal, due largely, if not solely,

to deficient precipitation in the cold weather period over the plains and adjacent mountain areas of Northern India. In each of these months, except that of May 1896, the mean pressure of the Indian area was in defect, the deficiency averaging—'028" for the first five years and almost identical in amount with this in four out of these five years. It may be noted that the temperature conditions of May 1898 were in some respects unique, more especially in the locality of the area of greatest excess of temperature.

Excessive temperature in the month of May generally gives rise to a larger diminution of pressure over the Indian area than that normal to the month, and hence to a deficiency of pressure (as compared with the normal). This decrease of pressure is chiefly, if not solely, a temperature effect.

This is further confirmed by the fact that in each of these months (*viz.*, May 1879, 1880, 1890, 1892, 1894, 1895, 1896, 1897 and 1898) pressure was in relative excess, or the vertical pressure anomalies were positive at the hill stations in Northern India. This is established by the following data for six pairs of stations :—

Pair of stations.	VERTICAL PRESSURE ANOMALY IN MAY.								
	1879.	1880.	1890.	1892.	1894.	1895.	1896.	1897.	1898.
Quetta and Jacobabad.	?	?	+ '006	+ '050	+ '037	+ '063	+ '046	+ '050	+ '012
Leh and Lahore	?	+ '069	+ '063	+ '125	+ '082	+ '101	+ '085	?	+ '003
Murree and Rawalpindi.	+ '040	+ '038	+ '041	+ '035	+ '028	+ '057	?	+ '017	+ '001
Simla and Ludhiana.	?	?	+ '033	+ '049	+ '042	+ '060	+ '050	+ '054	+ '009
Chakrata and Roorkee.	+ '044	+ '015	+ '022	+ '040	+ '035	+ '045	+ '038	+ '058	+ '025
Darjeeling and Calcutta.	+ '032	+ '007	+ '002	+ '003	+ '023	+ '033	+ '011	+ '028	+ '015
Mean	+ '039	+ '032	+ '028	+ '050	+ '041	+ '060	+ '046	+ '041	+ '011

The large positive vertical anomalies were evidently in each case the result of the temperature conditions of the month in Northern India, which, by the various air movements which it either strengthened or initiated, diminished pressure at the level of the plains in Northern India and to a smaller extent at the level of the hills, thus giving positive vertical pressure anomalies, which increased with elevation and were in most years greatest for Leh.

A second interesting feature of the meteorology of the month of May in each of these years, except 1879, was that pressure was in local excess in the Peninsula, more

especially in the West Coast districts, and in local defect in Northern India. The following table gives data in illustration :—

AREA.	STATION.	PRESSURE ANOMALY OF MAY.								
		1879.	1880.	1890.	1892.	1894.	1895.	1896.	1897.	1898.
NORTHERN INDIA .	Calcutta	"	"	"	"	"	"	"	"	"
	Patna	+ '003	+ '002	- '001	- '019	- '035	- '024	- '010	- '007	- '006
	Allahabad	- '014	+ '019	- '013	- '037	- '055	- '030	- '023	- '029	- '018
	Lahore	- '012	0	0	- '030	- '037	- '040	- '026	- '028	- '006
	Mooltan	- '003	- '030	- '019	- '036	- '031	- '038	- '019	- '020	+ '001
	Peshawar	+ '013	- '027	- '016	- '045	- '036	- '048	- '031 ?	- '027	+ '008
	Rajkot	+ '026	- '036	- '005	- '029	- '014	- '022	- '014	+ '011	- '002
WESTERN INDIA AND MALABAR.	Bombay	- '014	+ '005	+ '044	+ '050	+ '059	+ '044	+ '041	+ '027	+ '025
	Karwar	- '040	+ '012	+ '025	+ '021	+ '050	+ '043	+ '031	+ '024	+ '018
	Poona	?	+ '030	+ '031	+ '015	+ '050	+ '049	+ '033	+ '028	+ '014
	Belgaum	+ '016	+ '012	+ '027	+ '035	+ '044	+ '030	+ '029	+ '019	+ '018
	Cochin	- '022	- '005	+ '014	+ '027	+ '047	+ '036	+ '035	+ '020	+ '032
	Calicut	- '007	- '010	?	+ '036	+ '035	+ '034	+ '031	+ '007	+ '004
		?	?	?	+ '022	+ '035	+ '032	+ '027	+ '007	+ '004

The preceding data establish that generally, if not invariably, exaggerated hot weather conditions in Northern India in May tend to give a larger deficiency of pressure in Northern India than the mean deficiency of the whole of India, and a smaller deficiency in the Peninsula (more especially in the West Coast districts), or, in other words, to give negative pressure anomalies in Northern India and positive anomalies in the Peninsula. This is mainly, if not entirely, a result of the abnormal temperature conditions of the period.

It may hence be laid down, as a general rule, that more strongly marked hot weather conditions than usual (*i.e.*, increased temperature and great dryness of the air) in Northern India in the month of May accompany or initiate the following pressure conditions :—

- (1) General deficiency of pressure over India.
- (2) Relative excess of pressure at the level of the hill stations in Northern India, as compared with that at the level of the plains.
- (3) Relative deficiency of pressure in Northern India, usually most marked in or near the area of greatest excess of temperature.
- (4) Relative excess of pressure in the Peninsula, greatest in amount in the west coast districts, Gujarat and Kathiawar.

The highest temperatures of the year were registered during the last week of May and the first week of June. The following table gives vertical pressure anomalies

for each month of the hot weather period of 1898 in Northern India, determined from the variation data of six pairs of stations. It will be seen that the vertical pressure anomalies in Upper India, which were small in March and May, were positive and large in amount in April :—

PAIR OF STATIONS.	VERTICAL PRESSURE ANOMALY IN			
	March 1898.	April 1898.	May 1898.	Period March to May.
	"	"	"	"
Quetta and Jacobabad	+ '012	+ '083	+ '012	+ '036
Leh and Lahore	- '024	+ '097	+ '003	+ '025
Murree and Peshawar	+ '017	+ 070	+ '011	+ '033
Simla and Ludhiana	+ '017	+ '062	+ '009	+ '029
Darjeeling and Dhubri	+ '038	?	+ '026	?
Mount Abu and Deesa	+ '001	+ '007	- '027	- '006

The meteorology of India during the hot weather of 1898 was determined mainly, if not entirely, by meteorological actions and conditions in India itself and by the distribution of the snowfall in the Himalayan area.

The cold weather or winter snowfall was below the normal in the Western Himalayas and Afghanistan

mountains, and the winter terminated earlier than usual. The extent of the snow-clad surface was less than usual at the beginning of the winter and was hence below the normal in March and April. The general character of the weather in Northern India in these months was such as is invariably associated with deficient winter precipitation and early termination of the winter in the Western Himalayas. Temperature was normal or in slight defect in March over the whole of Northern and Central India and was in considerable to large excess in April. The air was extremely dry—drier in fact than in the corresponding months of the past 12 years at least. There was less cloud than usual, and the precipitation was more or less in defect over the greater part of India. A series of feeble disturbances or depressions affected Northern India in March, but they gave little or no rain, except thundershowers in the North Punjab and the Punjab and Kashmir hills. April was unusually free from disturbance, more especially in North-Eastern India. April was in fact the culmination of the conditions following on the scanty winter snowfall. May was, on the whole, less disturbed than usual, more especially in North-Eastern India, where thunderstorms and nor'westers were of much less frequent occurrence than is usual in that month. The exaggerated hot weather conditions of April and the first week of May were, however, followed by a disturbance in the second week of May, more general and severe than usually occurs in that month. Series of thunderstorms visited the greater part of the country but the chief feature of the disturbance was a general and moderately heavy fall of snow over the interior ranges of the whole of the Western Himalayas.

This gave rise to a cool wave of considerable intensity which advanced eastwards from Upper India and Central India and, reduced temperature from 10° to 30° below that prevailing before the storm. The effect of this cool wave passed away by the end of the third week of the month and very dry and hot weather prevailed during the remainder of the month. On the mean of the whole month weather was slightly hotter and drier than usual in the whole of India, and strongly marked hot weather conditions prevailed at the end of the month, and were associated with pressure conditions favourable to the advance of a normal monsoon and its rapid extension over the whole of India.

The larger features of this period were hence directly related to the snowfall of the previous cold weather season and to that of the second week of May in the North-West Himalayas.

A remarkable local feature of the meteorology of the period was the very scanty rainfall in Assam, Cachar and East Bengal. This was associated with excessive temperature, abnormal dryness of the air and great deficiency of cloud. Silchar was the centre of this area of scanty rainfall.

The following gives variation data for five representative stations in that area :—

STATION.	RAINFALL.							
	MARCH.		APRIL.		MAY.		TOTAL OF PERIOD.	
	Variation from normal.	Percentage variation from normal.	Variation from normal.	Percentage variation from normal.	Variation from normal.	Percentage variation from normal.	Variation from normal.	Percentage variation from normal.
	Inches.		Inches.		Inches.		Inches.	
Sibsagar	-4.65	-92	+0.97	+10	-1.54	-12	-5.22	-19
Dhubri	-1.93	-100	+0.14	+3	-0.78	-6	-2.57	-12
Silchar	-7.69	-88	-12.56	-88	-10.93	-64	-31.18	-78
Narayanganj	-2.67	-100	-3.72	-72	-3.73	-36	-10.12	-56
Chittagong	-0.39	-15	-2.81	-73	-4.85	-46	-8.05	-48

The data show that the rainfall was more or less in large defect in the area under consideration, and that the deficiency was much greater at Silchar in actual as well as in percentage amount than elsewhere.

The following tables show that the deficient rainfall at Silchar was associated with a large local deficiency of humidity and cloud and a large excess of temperature :—

STATION.	VARIATION FROM NORMAL OF HUMIDITY IN			
	March 1898.	April 1898.	May 1898.	Period, March to May 1898.
Sibsagar	-4	+4	+1	0
Dhubri	-6	-1	-4	-4
Silchar	-17	-13	-12	-14
Narayanganj	-11	-3	-6	-7
Chittagong	0	+6	0	+2

STATION.	VARIATION FROM NORMAL OF CLOUD AMOUNT.			
	March 1898.	April 1898.	May 1898.	Period March to May 1898.
Sibsagar	-1.7	+1.1	-0.4	-0.3
Dhubri	-1.6	+0.2	-1.4	-0.9
Silchar	-3.2	-1.9	-0.3	-1.5
Narayanganj	-2.5	+0.4	+1.0	-0.4
Chittagong	-2.2	+0.1	-1.0	-1.0

TEMPERATURE.

STATION.	VARIATION FROM NORMAL OF MEAN TEMPERATURE.			
	March 1898.	April 1898.	May 1898.	Mean of period, March to May 1898.
	°	°	°	°
Sibsagar	+1'2	+0'7	-0'3	+0'5
Dhubri	-0'3	+2'1	+1'2	+1'0
Silchar	+1'4	+5'3	+3'5	+3'4
Narayanganj	-0'5	+1'9	+1'3	+0'9
Chittagong	-1'5	+0'9	+1'8	+0'4

III.—The south-west monsoon period, June to September 1898.—The meteorological conditions in the Indian land area antecedent to the establishment of the south-west monsoon were favourable to a normal monsoon and also to its rapid extension over nearly the whole of India. The following gives the most prominent and important of these antecedent conditions :—

(1) The cyclical variation of the rainfall in India due to general, but as yet unknown, causes and actions, which has been the dominating feature of the meteorology of India during the past six years, has terminated, and India, judging from the limited experience of the past twenty years, is now entering on a period of comparatively small variations from the normal rainfall.

(2) The winter snowfall (December 1897 to April 1898) was much below the normal over the whole of the Western Himalayas and in Afghanistan. Heavy local snow fell in Chitral, but it was too restricted to exercise any general influence on the meteorology of India. There was, however, late and unseasonable snow in the month of May over a part of the Western Himalayas. It was apparently moderate in amount and melted rapidly, so that at the end of May conditions were normal. Light snow, however, fell again on the 1st June. These snowfalls indicate the existence of other abnormal conditions in the Himalayan area, which tended to retard the advance of the Bombay current.

(3) The pressure, temperature and humidity conditions in India during the past five months have been such as usually obtain in years of deficient snowfall in the Himalayan area. The most important feature has been a marked tendency to relatively deficient pressure in North-Eastern India and Burma, more especially as compared with Western India, where pressure has been persistently in excess.

(4) The abnormal pressure conditions in North-Eastern India [stated in (3)], which were remarkably persistent

from the end of October until the fourth week of May, changed to some extent during the last week of May, and became more favourable generally. Previous to that period the pressure conditions were such as would tend to determine the Bay current more largely to Burma and the Bombay current more directly across Central India and the Deccan than usual, and hence withdraw it partially from Upper India (*i.e.*, the Punjab and Rajputana). The conditions during the last week of May were, on the other hand, favourable for the extension of the currents over the whole monsoon area to their limits in the Punjab.

(5) The conditions in the Indian seas and the Indian Ocean were, so far as could be ascertained, satisfactory and favourable, and indicated that the conditions in the south-east trades region were at least normal, and that the air movement in that area was somewhat stronger than usual.

The following were the inferences or forecast (issued in the first week of June) of the probable distribution of the monsoon rainfall based on these conditions :—

“(1) Conditions are favourable to the prevalence of monsoon currents of at least normal strength in the Bay of Bengal. The rains will probably commence about the normal date in Bengal.

(2) Conditions are also, on the whole, favourable to the prevalence of monsoon currents of at least normal strength in the Arabian Sea. The abnormal snowfall in the Punjab Himalayas slightly retards the establishment of the monsoon on the Bombay Coast, and causes it to be slightly weaker than the normal in June. The influence of the snowfall will very probably be slight, and, so far as can be judged, the monsoon ought to set in on the Bombay coast before the 7th of June.

(3) Conditions are favourable in Burma, and it will probably receive at least normal rain. The rainfall is more likely to be in excess in Lower Burma than in Upper Burma.

(4) The rainfall may be deficient to a slight or moderate extent, depending chiefly upon the strength of the monsoon, in Sind, Cutch, the North and West Punjab and West Rajputana; it will very probably be at least normal in amount in Central India and the northern half of the Peninsula, except perhaps Berar, Khandesh and the West Deccan, and may be in moderate excess in the eastern half of the North-Western Provinces, Bihar, the Central Provinces and the eastern states of Central India. It will probably be normal or in excess in Burma, Assam and perhaps in East and North Bengal, and may be in slight defect in West Bengal.”

These inferences were fully borne out by experience. The monsoon currents were practically of normal strength, whether judged by the strength of the winds in the Indian seas or the distribution and amount of the south-west monsoonrain fall in India. On the average of the whole period the rainfall in India was practically normal.

The following gives a very brief summary of the chief features of the south-west monsoon period of 1898:—

METEOROLOGICAL PROVINCE.	SOUTH-WEST MONSOON PERIOD, JUNE TO SEPTEMBER 1898.							
	Variation from normal of mean monthly pressure.	Variation from normal of mean maximum temperature.	Variation from normal of mean minimum temperature.	Variation from normal of mean aqueous vapour pressure.	Variation from normal of mean relative humidity.	Variation from normal of mean cloud amount.	Total variation from normal of average actual rainfall.	Percentage variation from normal of rainfall.
Burma Coast and Bay Islands.	—'017	+0'3	+0'6	+0'13	+1	+0'6	+4'71	+4
Burma Inland.	—'012	—0'3	+0'3	...	...	...	—0'40	—1
Assam.	—'019	0	0	+0'03	0	+0'1	—4'00	—6
Bengal and Orissa.	—'020	—0'3	+0'2	—'002	0	+0'4	+5'97	+11
Gangetic Plain and Chota Nagpur.	—'023	—1'0	—0'1	+0'12	+1	+0'5	+9'45	+25
Upper Sub-Himalayas.	—'019	+0'1	+1'2	+0'10	0	—0'3	—1'95	—6
Indus Valley and North-West Rajputana.	—'024	+1'4	+1'5	+0'13	—1	—0'2	—2'01	—29
East Rajputana, Central India and Gujarat.	—'010	+1'3	+1'1	+0'23	—1	0	—3'76	—13
Deccan.	—'008	—0'1	+0'4	+0'02	+1	+0'6	+1'58	+5
West Coast.	—'011	+0'6	+0'7	+0'01	—2	+0'5	+5'87	+7
South India.	—'010	+0'9	+0'7	—'007	—2	+0'1	+2'67	+0

The chief abnormal conditions of the period were mainly dependent upon the distribution of the rainfall during the period in Northern India. They were as follows:—

(1) Pressure was in slight to moderate defect on the mean of the period in Northern India and in slight defect in the Peninsula.

(2) Temperature was in slight excess over the Peninsula and North-Western India, the increase being generally as large in the night as in the day temperature, and was largest in the area of deficient rainfall in North-Western India, including Central India, Rajputana, Sind and the West and South Punjab.

(3) There was, on the whole, somewhat less cloud than usual in North-Western India and more cloud in the Peninsula and North-Eastern India, and the humidity was normal or in very slight defect, chiefly due to increased temperature.

The following gives comparative rainfall data of thirteen large areas for the period, June to October 1898:—

PROVINCE OR DIVISION.	RAINFALL DURING THE SOUTH-WEST MONSOON PERIOD, JUNE TO OCTOBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Punjab	12'85	15'15	—2'30	—15
Rajputana	12'16	18'66	—6'50	—35
Central India	36'70	40'95	—4'25	—10
North-Western Provinces and Oudh.	41'75	34'70	+7'05	+20
Bihar	52'49	43'50	+8'99	+21
Chota Nagpur	52'52	47'49	+5'03	+11
Bengal	68'19	59'84	+8'35	+14
Assam	72'75	73'26	—0'51	—1
Berar	26'31	37'48	—11'17	—30
Central Provinces	45'61	45'80	—0'19	0
Madras	34'84	34'20	+0'64	+2
Bombay	41'59	41'27	+0'32	+1
Burma	97'60	93'84	+3'76	+4

The chief features of the rainfall of the whole period were as follows:—

(1) The rainfall was practically normal on the mean of the Indian area. It was slightly above the normal during the first two months and below it in August and September.

(2) Rainfall was on the mean of the whole period more or less below the normal over Baluchistan, the South-East, South, Central, West and East Punjab, the Punjab Hills, Rajputana, Central India, Berar, Central and Upper Burma, Orissa, Bengal Hills, Assam Surma and Hills, North-Western Provinces West, Central Provinces West and East, Central Madras, Malabar, Hyderabad North, Khandesh, Kathiawar and Gujarat.

(3) It was most largely in defect, relatively to the normal, in the South-East Punjab, Berar and Rajputana.

(4) It was in moderate to largish excess in the belt of country including Bihar and the greater part of the North-Western Provinces. A succession of storms passed across this belt in July and August giving frequent cyclonic down-pours.

(5) Rainfall was in considerable excess in South Madras, Mysore and the North-Western Provinces Hills division.

(6) Rainfall was normal over the central and western districts of the Peninsula and in Burma.

The combination of a South East Trades circulation normal or slightly feeblor than usual at the commencement of the monsoon and of favourable conditions in India during the hot weather month of May 1898, appears to be sufficient to account for the following features of the

rainfall of the first two months of the south-west monsoon period :—

(1) The slight delay in the establishment of the monsoon currents over the Indian seas and the coast districts of India in the beginning of June.

(2) Their rapid extension over the Indian land area to the limits of the Punjab in the third week of June.

(3) The steadiness of the monsoon currents throughout the whole period.

The chief feature of the south-west monsoon currents in 1898 was their determination to North-Western India in the months of June and July and to North-Eastern India in August and September.

The following gives average rainfall variation data for these two periods in thirteen political divisions :—

PROVINCE OR DIVISION.	RAINFALL.			
	JUNE AND JULY.		AUGUST AND SEPTEMBER.	
	Actual variation.	Percentage variation.	Actual variation.	Percentage variation.
	Inches.		Inches.	
Punjab	+1'43	+20	-3'41	-45
Rajputana	-1'39	-15	-4'89	-52
Central India	-2'48	-12	-0'22	-1
North-Western Provinces and Oudh	+1'28	+8	+7'14	+42
Bihar	-2'59	-13	+13'28	+65
Chota Nagpur	+3'42	+15	+2'51	+11
Bengal	-1'02	-3	+7'72	+31
Assam	-4'22	-11	+2'35	+8
Berar	-2'99	-16	-5'97	-37
Central Provinces	+1'15	+5	+0'03	0
Madras	-0'03	0	-0'18	-2
Bombay	+3'23	+14	-1'48	-9
Burma	+1'72	+4	+5'26	+14

The preceding data indicate the marked tendency to increased rainfall in June and July over North-Western India, and in August and September in North-Eastern India and Burma.

These changes in the distribution of the rainfall during the monsoon period accompanied corresponding changes in the pressure distribution, and also slight changes in the strength of the south-east trades so far as is indicated by the available information.

The information at present available for discussing the meteorology of the south-east trades region of the Indian Ocean is very limited.

The following gives variation data of the Royal Alfred Observatory, Mauritius, for nine months of the year,

deduced from a comparison of the means of 1898 with normal means based on the observations of the previous 23 years :—

MONTH.	VARIATION FROM NORMAL OF				
	Pressure.	Rainfall.	Percentage variation of rainfall.	Hourly wind velocity in miles.	Percentage variation of wind velocity.
	"	Inches.			
January 1898	+0'60	-0'77	-11	-1'4	-13
February „	-0'60	-3'14	-46	-1'2	-11
March „	-0'37	-1'56	-19	-0'3	-3
April „	-0'36	-0'67	-12	+3'3	+31
May „	-0'29	+3'88	+87	+2'6	+25
June „	-0'15	-0'87	-44	-0'2	-2
July „	-0'32	-0'52	-23	+0'5	+4
August „	-0'28	+4'19	+173	-0'4	-3
September „	-0'53	-0'09	-6	-1'2	-10

The most remarkable feature of the meteorology of the period at the Mauritius was the increased air movement in April and May immediately antecedent to the northward extension of the south-east trades across the equator. Winds were practically normal in June and July and slightly weaker than usual in August and September.

In the following table a similar comparison is given for Zanzibar, the normal means being deduced from the observations of seven years :—

MONTH.	VARIATION FROM NORMAL OF				
	Pressure.	Rainfall.	Percentage variation of rainfall.	Hourly wind velocity in miles.	Percentage variation of wind velocity.
	"	Inches.			
January 1898	+0'20	-1'42	-48	-1'3	-16
February „	+0'16	-2'64	-89	-1'1	-17
March „	-0'14	+0'95	+18	-1'0	-17
April „	-0'21	-10'06	-85	-0'9	-12
May „	-0'49	-5'38	-61	-0'3	-4
June „	-0'14	-0'35	-28	+0'6	+7
July „	-0'38	+0'53	+25	+0'2	+2
August „	-0'09	-1'74	-95	+1'0	+14
September „	-0'31	+0'02	+1	-0'6	-10

The preceding data indicate that the meteorology of Zanzibar in 1898 was characterized by unusual lightness of the winds from January to April. The rainfall was in

large defect in April and May. The variations of the meteorological conditions from the normal were generally similar in character to those which obtained at the Mauritius. It is noteworthy that, although the winds were normal or stronger than usual in June, July and August, they were slightly below the normal in September.

Hence, as at Mauritius, there was a relative decrease in the velocity of the air movement in the second half of the monsoon period as compared with the first half.

The following table gives the mean pressure differences between Mauritius and Zanzibar and Mauritius and Seychelles (determined from the data of the four years, 1894—97) and the actual differences in the corresponding months of the year 1898:—

MONTH.	PRESSURE DIFFERENCE.					
	MAURITIUS MINUS ZANZIBAR.			MAURITIUS MINUS SEYCHELLES.		
	Mean of 1894 to 1897.	Mean of 1898.	Difference.	Mean of 1894 to 1897.	Mean of 1898.	Difference.
	"	"	"	"	"	"
March	+050	+048	—002	+063	+049	—014
April	+055	+067	+012	+108	+101	—007
May	+061	+081	+020	+166	+169	+003

MONTH.	PRESSURE DIFFERENCE.					
	MAURITIUS MINUS ZANZIBAR.			MAURITIUS MINUS SEYCHELLES.		
	Mean of 1894 to 1897.	Mean of 1898.	Difference.	Mean of 1894 to 1897.	Mean of 1898.	Difference.
	"	"	"	"	"	"
June	+048	+078	+030	+220	+227	+007
July	+073	+090	+017	+222	+230	+008
August	+111	+083	—028	+245	+221	—024
September	+115	+104	—011	+218	+210	—008
Mean of whole period .	+073	+079	+006	+177	+172	—005
Mean of June to September.	+087	+089	+002	+226	+222	—004

The preceding data establish that the pressure differences of total gradient between Mauritius and the equatorial belt as represented by the Seychelles were greater than the mean of the previous four years in the first two months of the south-west monsoon of 1898 and were slightly less in August and September.

In the following table is given a comparison of the velocity of the air movement at these three stations in 1897 and 1898:—

MONTH.	1897.						1898.					
	PORT VICTORIA (SEYCHELLES).		ZANZIBAR.		MAURITIUS.		PORT VICTORIA (SEYCHELLES).		ZANZIBAR.		MAURITIUS.	
	Mean hourly velocity.	Percentage variation.	Mean hourly velocity.	Percentage variation.	Mean hourly velocity.	Percentage variation.	Mean hourly velocity.	Percentage variation.	Mean hourly velocity.	Percentage variation.	Mean hourly velocity.	Percentage variation.
January	5'7	—5	6'6	—20	8'4	—25	5'0	—17	6'9	—16	9'7	—13
February	6'3	+5	6'5	—2	16'1	+40	8'3	+38	5'5	—17	10'2	—11
March	5'5	+4	3'7	—37	10'1	+1	3'8	—28	4'9	—17	9'7	—3
April	5'7	+33	6'5	—11	12'8	+22	4'8	+12	6'4	—12	14'0	+31
May	6'3	—13	6'5	—20	11'7	+15	5'5	—24	7'8	—4	12'9	+25
June	7'1	—39	8'0	—11	12'0	+5	11'3	—3	9'6	+7	11'2	—2
July	11'0	—8	6'3	—27	12'1	+3	11'5	—4	8'8	+2	12'3	+4
August	11'3	—16	6'6	—6	14'1	+15	12'6	—7	8'0	+14	12'0	—3
September	12'7	+4	5'0	—14	14'7	+23	11'5	—6	5'2	—10	10'8	—10
October	8'0	+5	4'0	—20	10'6	—5	6'8	—11	4'3	—14	10'3	—7
November	4'6	—20	4'1	—15	10'3	—5	4'3	—26	4'3	—10	8'9	—18
December	6'3	—3	7'2	+14	11'4	+4	6'9	+6	6'9	+10	10'4	—5

The preceding data show that the air movement in the month of May 1898 was stronger than usual at Mauritius,

below the normal at the Seychelles and was normal at Zanzibar. It was practically normal at all three stations

in June and July and was in general slight to moderate defect in September, October and November.

The following table gives a comparison, week by week, from the 1st of May to the end of June of the air pressure and velocity of the air movement at Port Victoria, Seychelles, in the four years, 1895, 1896, 1897 and 1898:—

Weekly means of pressure and wind velocity at Port Victoria, Seychelles.

WEEK.	1895.		1896.		1897.		1898.	
	10 A.M. pressure reduced to sea level and constant gravity at Lat. 45°.	Hourly wind velocity in miles.	10 A.M. pressure reduced to sea level and constant gravity at Lat. 45°.	Hourly wind velocity in miles.	10 A.M. pressure reduced to sea level and constant gravity at Lat. 45°.	Hourly wind velocity in miles.	10 A.M. pressure reduced to sea level and constant gravity at Lat. 45°.	Hourly wind velocity in miles.
1st to 7th May	29°899	5·9	29°915	5·3	29°886	7·1	29°863	3·1
8th „ 14th „	°912	3·6	°957	8·3	°931	6·4	°879	2·4
15th to 21st „	°899	3·7	°921	10·1	°906	6·2	°896	7·9
22nd to 28th May.	°925	6·4	°955	9·4	°875	6·9	°901	7·5
29th May to 4th June.	°895	9·9	°923	9·4	°852	4·5	°845	7·5
5th to 11th June.	°863	12·9	°913	9·5	°864	7·3	°874	10·8
12th to 18th June.	°886	11·6	°876	11·8	°916	7·8	°921	13·7
19th to 25th June.	°976	10·3	°951	9·9	°934	9·0	°928	10·3

The hot weather conditions of pressure and temperature were strongly marked in 1898 and the slight delay in the strengthening of the winds at the Seychelles immediately antecedent to the monsoon in 1898, as in 1897, was not due to conditions in either the Indian land or sea area and was hence due to conditions outside of India and probably present in the Indian Ocean.

The available data indicate that the south-east trade winds were probably of normal strength in June and July 1898 and were slightly feebler than usual from September to November.

The data also show that the gradients were above the normal in June and July and were slightly feebler than usual in August and September, and were hence in accordance with the wind data.

The preceding data have indicated that during the first half of the monsoon the south-west monsoon currents were more largely determined towards North-Western and Central India than usual in virtue of the abnormal features of the pressure conditions established in May immediately antecedent to the arrival of the monsoon

rains. This slightly greater set of the current towards North-Western India tended to perpetuate the pressure conditions and the chief abnormal feature of the pressure distribution in June and July was a slight local deficiency in North-Western and Central India as contrasted with a slight local excess in North-Eastern India and the Peninsula.

Important changes of the pressure and other meteorological conditions occurred in the beginning of August. It is always difficult to assign the relation of cause and effect to changes of meteorological conditions and it is especially difficult in the case of the variations in the intensity and extension of the south-west monsoon currents. The heavy rainfall in July was followed by a local rise of pressure in Upper India. Accompanying this change there occurred a shift in the chief goal of the monsoon currents similar in character to that which usually obtains at the end of the rains in Upper India. The Bay current was determined to a greater extent to North-Eastern India and less to Upper India and the Bombay current more across the centre and head of the Peninsula and less across Rajputana. This tended to give an excess rainfall to North-Eastern India (at the expense of North-Western India) and hence also decreased pressure locally in the former area. The abnormal features of the pressure conditions in August and September were hence the inverse of those obtaining in June and July. The following gives data in illustration:—

PROVINCE OR DIVISION.	PRESSURE ANOMALY.	
	June and July.	August and September.
	"	"
Punjab	+°001	—°019
Rajputana	+°002	+°011
Central India	+°007	+°005
North-Western Provinces and Oudh .	+°004	—°007
Bihar	+°002	—°024
Chota Nagpur	—°009	—°019
Bengal	+°003	—°016
Assam	+°004	—°012
Berar	+°007	+°024
Central Provinces	+°004	+°015
Madras	—°001	+°013
Bombay	—°002	+°014
Burma	—°007	+°006
Sind	—°005	+°001

IV.—The retreating south-west monsoon period, October to December 1898.—The following

gives mean variation data of this period for eleven meteorological provinces:—

METEOROLOGICAL PROVINCE.	RETREATING SOUTH-WEST MONSOON PERIOD, OCTOBER TO DECEMBER 1898.							
	Variation from normal of mean monthly pressure.	Variation from normal of mean maximum temperature.	Variation from normal of mean minimum temperature.	Variation from normal of mean aqueous vapour pressure.	Variation from normal of mean relative humidity.	Variation from normal of mean cloud amount.	Total variation from normal of average actual rainfall.	Percentage variation from normal of rainfall.
	"	"	"	"	"	"	Inches.	
Burma Coast and Bay Islands.	—'015	+1'4	—0'2	—'015	—4	—0'2	—8'72	—54
Burma Inland .	—'019	+1'6	+0'3	...	...	...	—2'99	—46
Assam . .	—'021	+0'3	—0'3	—'011	—1	—0'4	—1'34	—21
Bengal and Orissa.	—'013	+0'3	+0'1	—'004	—1	—0'6	+1'93	+30
Gangetic Plain and Chota Nagpur.	—'025	+1'3	+0'5	—'008	—3	—0'5	—1'69	—56
Upper Sub-Himalayas.	—'024	+0'3	+0'6	—'032	—3	+0'2	+0'35	+33
Indus Valley and North-West Rajputana.	—'027	+1'2	—0'3	—'048	—8	—0'4	—0'14	—37
East Rajputana, Central India and Gujarat.	—'027	+2'5	+2'6	—'010	—3	0	—0'51	—49
Deccan . .	—'015	+3'3	+2'0	—'018	—4	—0'4	—2'78	—62
West Coast .	—'027	+1'0	+1'4	+ '011	—2	+0'2	+0'86	+ 7
South India .	—'017	+0'2	+0'9	+ '018	+2	+0'5	+5'33	+32

The following summarizes the chief features of the period:—

- (1) The mean pressure was below the normal over the whole Indian area. It was most largely in defect in the Indus Valley, Rajputana and Central India and on the West Coast, and least in defect in Burma and Bengal and in the Deccan. In other words, there was a slight excess in Burma, North-Eastern India and the centre and south of the Peninsula relatively to the remainder of the Peninsula and North-Western India.
- (2) The maximum temperature of the period was in excess in all divisions. The excess was large in the Deccan (+3°3) and East Rajputana and Central India (+2°5). The minimum temperature was practically normal except in the Deccan, West Coast and East Rajputana and Central India, where it was in excess. The excess was greatest in East Rajputana and Central India (+2°6). The mean temperature of the period was above the normal over the whole area, the excess being greatest in the Deccan and East Rajputana and Central India.

- (3) The mean relative and absolute humidities were more or less below the normal over the whole Indian area, except Southern India. The mean relative humidity was most largely below the normal in the Indus Valley and North-West Rajputana.

- (4) The rainfall of the period was in moderate to large defect in Burma and Assam. The following gives data in illustration:—

METEOROLOGICAL PROVINCE.	RAINFALL.		
	Average actual, October to December 1898.	Variation from normal during period October to December 1898.	Percentage variation from normal.
	Inches.	Inches.	
Burma Coast and Bay Islands . .	7'56	—8'72	—54
Burma Inland	3'46	—2'99	—46
Assam	4'91	—1'34	—21

- (5) The rainfall of the period was in slight excess in Bengal due to heavy rain from a cyclonic storm in October and in the Punjab to a moderate burst of rain in the last week of December.

- (6) The rainfall of the period was very scanty in the North-Western Provinces, Central India, North Bombay, Berar, the Central Provinces and Deccan, areas which usually receive moderate rain during this period. The following gives data:—

AREA.	RAINFALL.			
	Average actual, October to December 1898.	Average normal October to December.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
North-Western Provinces and Oudh.	0'64	1'93	—1'29	—67
Rajputana	0'45	0'58	—0'13	—22
Sind	0'03	0'21	—0'18	—86
Central India	0'30	2'30	—2'00	—87
Berar	0'40	3'67	—3'27	—89
Central Provinces	0'72	2'79	—2'07	—74
Bombay Deccan	5'64	6'85	—1'21	—18
Madras Deccan	6'23	8'29	—2'06	—25
Gujarat	0'25	1'60	—1'35	—84
Kathiawar	0'35	1'06	—0'71	—67

- (7) The rainfall of the period was more or less in excess in South Madras, Mysore, and the

Coromandel Coast districts, as is shown by the following data :—

DIVISION.	RAINFALL.			
	Average actual, October to December 1898.	Average normal October to December.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Madras, East Coast, Central .	25.80	21.69	+ 4.11	+ 19
Ditto South .	37.67	22.13	+ 15.54	+ 70
Madras, South	22.95	16.18	+ 6.77	+ 42
Mysore	12.37	8.71	+ 3.66	+ 42

The larger features of the meteorology of the period were well marked. The most important was the contrast between the abundant rainfall in the southern half of the Peninsula and the deficient rainfall in Burma, Assam and the Gangetic Plain during the period.

The monsoon currents, as already pointed out, withdrew from Upper India in the third week of September. The track of the cyclonic storms of September was further east than usual due to the early eastward shift of the belt of low pressure.

The termination of the rains in Upper India in the third week of September was accompanied by a large increase of pressure in that area similar in character and amount to that which always occurs in North-Western India on the termination of the south-west monsoon. On the other hand, the early withdrawal of the monsoon currents from Bengal and Burma was followed by a larger rise in October than is usual and hence pressure was in local excess in the greater part of Burma, North-Eastern India and the North-East Deccan.

This feature was brought into greater prominence by an equally persistent deficiency of pressure in Southern India, Ceylon and the south of the Bay in October and November. The abnormal features were slightly modified in December, in which month the areas of excess and deficient pressure shifted slightly south and an area of deficient pressure appeared in Upper Burma and the northern districts of North-Eastern India.

The following table gives the pressure anomalies of the eleven meteorological provinces of India for the months of September, October, November and December and illustrates the more important abnormal pressure conditions of the period :—

METEOROLOGICAL PROVINCE.	PRESSURE ANOMALY					
	September 1898.	October 1898.	November 1898.	December 1898.	Mean of October to December 1898.	Mean of November and December 1898.
Burma Coast and Bay Islands.	+ '013	— '008	+ '004	+ '019	+ '005	+ '012
Burma Inland . . .	+ '020	+ '009	+ '002	— '009	+ '001	— '004
Assam	+ '009	+ '015	+ '002	— '019	— '001	— '009
Bengal and Orissa .	+ '006	+ '007	+ '011	+ '002	+ '007	+ '007
Gangetic Plain and Chota Nagpur.	— '005	+ '005	— '006	— '014	— '005	— '010
Upper Sub-Himalayas.	— '001	— '002	— '004	— '007	— '004	— '006
Indus Valley and North-West Rajputana.	— '014	— '009	— '006	— '005	— '007	— '006
East Rajputana, Central India and Gujarat.	+ '001	— '002	— '013	— '007	— '007	— '010
Deccan	+ '006	+ '007	+ '005	+ '003	+ '005	+ '004
West Coast	— '020	— '018	— '004	+ '002	— '007	— '001
South India	— '007	— '006	— '001	+ '013	+ '002	+ '006

The data of the preceding table show a strong tendency to local excess of pressure during the whole period, September to November, in Bengal, Burma, Orissa and the north and east of the Bay. It was marked in October when the monsoon currents were withdrawing from North-Eastern India and persistent during the remainder of the period and shifted slightly southwards in position with the advance of the period.

The distribution of the rainfall of this period in the Peninsula was opposite in general character to that of the corresponding periods of the years 1896 and 1897.

The pressure conditions of the period were favourable to the determination of the retreating south-west monsoon to the Madras Coast districts and Southern India, whilst they were unfavourable to its diversion to the Andaman Sea and Tenasserim. The rains practically ceased in the fourth week of October in Burma, and the rainfall in November and December was hence unusually scanty in that area.

The following table shows the distribution of the rainfall during this period in the Peninsula :—

DIVISION.	RAINFALL OF PERIOD, OCTOBER TO DECEMBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Malabar Coast	18.64	14.85	+ 3.79	+ 26
Konkan	5.12	6.76	— 1.64	— 24
Bombay Deccan	5.64	6.85	— 1.21	— 18
Mysore	12.37	8.71	+ 3.66	+ 42

DIVISION.	RAINFALL OF PERIOD, OCTOBER TO DECEMBER.			
	Average actual, 1898.	Average normal.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	Inches.	
Hyderabad (North) . . .	1'49	4'66	-3'17	-68
" (South) . . .	3'02	4'51	-1'49	-33
Madras (South Central) . .	18'10	11'08	+7'02	+63
" East Coast (North) . .	11'00	10'03	+0'97	+10
" (Central) . . .	6'23	8'29	-2'06	-25
" East Coast (Central) . .	25'80	21'69	+4'11	+19
" " (South) . . .	37'67	22'13	+15'54	+70
" (South) . . .	22'95	16'18	+6'77	+42

The most remarkable feature of this period was the excessive temperature in the area including Berar, the Central Provinces, the North Deccan and perhaps Central India. Data have been given in the weather reviews for the months of November and December, and also in the temperature section of the present annual summary. It may be noted that a similar excess of temperature, which is of occasional occurrence during the retreating south-west monsoon period, prevailed in the years 1896, 1890 and 1877. The following gives variations data for the Central Provinces for the months of November and December in those years :—

YEAR.	NOVEMBER.			DECEMBER.		
	Variation from normal.			Variation from normal.		
	Mean maximum temperature.	Mean minimum temperature.	Mean temperature.	Mean maximum temperature.	Mean minimum temperature.	Mean temperature.
1877 . . .	+5'2	+1'8	+3'5	+3'1	+9'4	+6'3
1890 . . .	+1'1	+0'8	+1'0	+3'0	+6'3	+4'7
1896 . . .	+5'4	+6'0	+5'7	+3'2	+4'6	+3'9
1898 . . .	+3'6	+1'3	+2'5	+4'4	+5'6	+5'0

The two following tables give the variations of temperature, humidity, cloud and air movement from the normal in the four areas of most excessive temperature in November and December 1898 :—

November 1898.

AREA.	VARIATION FROM NORMAL OF							
	Mean maximum temperature.	Mean minimum temperature.	Mean temperature.	Mean aqueous vapour pressure.	Mean relative humidity.	Mean cloud amount.	Rainfall.	W IND.
	°	°	°	"	"	"	Inch.	Mean Velocity. Steadiness.
Berar . . .	+5'1	+2'1	+3'6	-0'06	-12	+0'7	-0'52	+21 +15
Central Provinces.	+3'6	+1'3	+2'5	-0'23	-6	-0'1	-0'40	+8 -14
Bombay Deccan	+1'9	+0'1	+1'0	-0'25	-1	-0'1	-0'04	+50 -23
Hyderabad . .	+1'7	+0'6	+1'2	-0'19	-3	+0'2	+0'06	+5 0

December 1898.

AREA.	VARIATION FROM NORMAL OF							
	Mean maximum temperature.	Mean minimum temperature.	Mean temperature.	Mean aqueous vapour pressure.	Mean relative humidity.	Mean cloud amount.	Rainfall.	W IND.
	°	°	°	"	"	"	Inch.	Mean Velocity. Steadiness.
Berar . . .	+6'1	+8'0	+7'1	+0'22	-7	+0'2	-0'54	+19 -32
Central Provinces.	+4'4	+5'6	+5'0	+0'25	-4	+0'2	-0'29	-3 -21
Bombay Deccan	+2'7	+4'3	+3'5	+0'41	+4	-0'1	-0'26	+27 -2
Hyderabad . .	+3'7	+5'5	+4'6	+0'52	0	+0'5	-0'45	-17 -7

The preceding data indicate that the common feature of excessive temperature in the two months was associated with opposite variations in the amount of aqueous vapour present in the air in the two months. Humidity was largely below the normal, but this was chiefly an effect of the prevailing high temperature. In both months there was a slight excess of cloud, although the rainfall of the period was practically or actually *nil* and in moderate defect.

The most remarkable feature of the period in the area of excessive temperature was the extreme and abnormal unsteadiness of the winds. This is shown by the following data for all second class stations in the area :—

STATION.	WIND STEADINESS.					
	November.			December.		
	Actual, 1898.	Normal.	Variation from normal.	Actual, 1898.	Normal.	Variation from normal.
Saugor . . .	% 20	% 39	-19	% 16	% 34	-18
Jubbulpore . . .	8	25	-17	21	17	+4
Raipur . . .	38	54	-16	14	47	-33
Nagpur . . .	42	60	-18	9	54	-45
Khandwa . . .	42	52	-10	12	42	-30
Akola . . .	78	49	+29	28	57	-29
Buldana . . .	53	52	+1	7	48	-41
Hyderabad (Dn.) . .	67	67	0	58	65	-7

The data show that this feature of abnormal unsteadiness of the winds was most strongly exhibited in the month of December, when the temperature was most largely in excess.

Winds differed very irregularly in strength from the mean of the period, as is shown below :—

STATION.	WIND VELOCITY IN MILES PER DIEM.					
	November.			December.		
	Actual, 1898.	Normal.	Percentage variation from normal.	Actual, 1898.	Normal.	Percentage variation from normal.
Saugor . . .	174	57	+100	97	60	+62
Jubbulpore . . .	48	39	+23	44	39	+13
Raipur . . .	52	79	-34	24	64	-63
Nagpur . . .	77	95	-19	41	83	-51
Khandwa . . .	87	64	+36	88	64	+42
Akola . . .	100	85	+18	106	80	+33
Buldana . . .	149	122	+22	143	132	+8
Hyderabad (Dn.).	93	88	+6	64	81	-21

The preceding remarks have shown the chief abnormal features prevailing in the areas of excessive temperature. These features were, it may be noted, most strongly exhibited when and where temperature was most excessive.

The period during which the feature of excessive temperature was most strongly exhibited was from the 5th to the 15th December.

The following table shows the variations of the maximum and minimum temperatures from the normal at six representative stations in the area, day by day, during that period :—

DATE.	VARIATION FROM NORMAL OF MAXIMUM TEMPERATURE.					
	Nagpur.	Indore.	Khandwa.	Malegaon.	Akola.	Amraoti.
5th December 1898 .	?	+1'5	+9'1	+9'4	+8'9	+8'3
6th " " .	+7'2	+3'9	+8'6	+6'9	+9'7	+7'6
7th " " .	+5'1	-3'2	+7'7	+4'7	+7'3	+7'0
8th " " .	+6'1	+1'7	+7'2	+5'7	+9'0	+7'6
9th " " .	+7'2	+5'3	+8'4	+6'1	+8'1	+7'2
10th " " .	+8'4	+7'2	+9'9	+7'9	+10'1	+9'4
11th " " .	+8'0	+8'7	+9'9	+7'6	+9'3	+8'4
12th " " .	+9'2	+7'9	+10'8	+9'2	+11'3	+10'5
13th " " .	+8'3	+8'0	+4'9	+4'1	+10'2	+9'5
14th " " .	+7'9	-3'1	+7'3	+4'4	+8'8	+8'5
15th " " .	+6'1	-0'8	+4'9	+3'2	+8'5	+8'2

DATE.	VARIATION FROM NORMAL OF MINIMUM TEMPERATURE.					
	Nagpur.	Indore.	Khandwa.	Malegaon.	Akola.	Amraoti.
5th Dec. 1898	?	+14'5	+22'2	+18'1	+16'7	+9'6
6th " "	+11'1	+13'1	+20'6	+17'3	+20'1	+12'5
7th " "	+9'7	+11'5	+17'7	+17'4	+16'4	+10'4
8th " "	+6'4	+11'1	+19'0	+14'3	+16'2	+8'8
9th " "	+8'1	+9'5	+14'4	+13'1	+13'6	+9'1
10th " "	+7'9	+9'9	+16'4	+12'6	+14'8	+9'0
11th " "	+7'9	+11'7	+17'6	+14'2	+13'9	+8'3
12th " "	+7'8	+15'7	+21'6	+16'3	+14'0	+6'7
13th " "	+14'0	+6'6	+15'6	+8'9	+14'2	+13'9
14th " "	+10'2	+0'5	+11'8	+7'4	+12'7	+12'1
15th " "	+7'7	-0'6	+9'4	+6'3	+11'6	+8'1

The data indicate that the excess was very large during this period, and was much larger in the night than the day temperature. The excess was most pronounced in the belt of country including the stations of Malegaon, Akola, Khandwa, and Nagpur in Khandesh, Berar and the central and western districts of the Central Provinces.

The following gives the variation of the 8 A.M. humidity from the normal at four second class stations in this belt of country :—

DATE.	VARIATION FROM NORMAL OF RELATIVE HUMIDITY.			
	Khandwa.	Akola.	Nagpur.	Jubbulpore.
5th December 1898 . . .	-8	-8	-4	-7
6th " "	-11	-5	+2	-14
7th " "	-7	-3	-13	-30
8th " "	-19	+3	-4	-16
9th " "	-12	-5	-1	-8
10th " "	-1	-4	+7	+3
11th " "	-6	-4	+3	+5
12th " "	+1	-7	+6	-7
13th " "	-8	-5	-13	+2
14th " "	+4	-1	+4	0
15th " "	-15	+9	+11	-24
8 A.M. normal	60	58	62	76

The preceding data show the large and rapid fluctuations in the humidity of the air, fluctuations which were local rather than general in character. In fact, on only four days were the variations of the same sign at all stations.

The following table gives the amount of cloud at 8 A.M. of each day of the period at four stations:—

DATE.	CLOUD AMOUNT AT 8 A.M.			
	Khandwa.	Akola.	Nagpur.	Jubbulpore.
5th December 1898	5	2	2	6
6th " "	7	4	2	8
7th " "	1	0	0	4
8th " "	1	4	3	2
9th " "	0	0	0	1
10th " "	0	0	7	3
11th " "	0	0	0	2
12th " "	9	2	6	4
13th " "	3	8	8	4
14th " "	1	4	2	2
15th " "	0	6	3	7
8 A.M. normal	1'3	1'9	2'0	1'6

The amount of cloud changed rapidly and irregularly, but was generally above the normal of the period.

The previous data have shown clearly the chief features of the meteorological conditions of the period accompanying the large excess of temperature, which was the most prominent feature. These were—

1st.—The prevalence of very light and extremely unsteady winds.

2nd.—Rapid changes in the humidity accompanying shifts of wind from westerly to easterly direction and *vice versa*.

3rd.—Large changes in the amount of cloud accompanying also very irregular and local distribution and apparently due to frequent shift of winds.

The examination of the corresponding periods of high temperature in November and December 1896 and 1890 shows that similar conditions obtained in those periods.

The data indicate clearly that the peculiar features of the meteorology of the period were connected with, and dependent upon, abnormal features in the air movement. The normal lower air movement in November and December over Northern and Central India is simple. It consists of a feeble horizontal outflow originating in Upper India. Winds range between north and north-west in the Punjab. This movement is continued as a drift from the north-west down the Gangetic Plain and as a drift from the north in North Rajputana, changing to north-east in South Rajputana and Central India and to east-north-east and east in the Central Provinces. In the latter area as in the Deccan, generally, the air movement is also in part due to a flow from the Bay of Bengal from the north-east or east. Hence in the area including Khandesh, Berar, the

Central Provinces and the North Deccan, the air movement is usually at this time in part due to a dry current from Upper India and partly to a moderately damp current from the Bay, the former predominating in the northern districts of this belt and the latter in the southern districts. In normal years the combined air movement gives a moderately strong and steady flow from east-north-east across this belt. Occasionally the gradual transition and shift of winds from north-west to east-north-east in Rajputana and Central India is not effected, and westerly winds obtain in these areas. Between this area of abnormal westerly winds in Central India and the Deccan area (over which the easterly drift from the Bay invariably obtains at this season) there is in such periods a broad belt of eight variable winds covering Khandesh, Berar and the Central Provinces, the northern and southern limits of this belt shifting slightly from day to day with the varying conditions of the period. It is, in fact, a belt of calms or light variable winds between two air currents moving in opposite directions. It is not shown on the charts of the day as an actual belt of low pressure between two regions of high pressure (decreasing to the belt). It is, on the other hand, exhibited as a belt in which pressure, relatively to the normal condition of the period, is in very slight local defect. It will suffice to show this by the pressure conditions in November and December 1898:—

AREA.	Station.	PRESSURE ANOMALY.	
		November, 1898.	December, 1898.
NORTH OF BELT	Deesa	—'016	—'006
	Nowgong	—'011	—'008
	Sutna	—'003	—'005
BELT OF LIGHT VARIABLE WINDS.	Khandwa	+ '016	+ '009
	Malegaon	—'010	—'013
	Akola	+ '003	—'002
	Jubbulpore	—'008	—'013
	Seoni	+ '020	+ '009
	Nagpur	+ '016	0
	Raipur	+ '014	0
SOUTH OF BELT	Poona	+ '003	—'004
	Sholapur	+ '009	+ '010
	Secunderabad	0	0
	Bellary	+ '001	+ '015

A consideration of the abnormal features of the air movement, it will be seen, explains fully the peculiar meteorological conditions in this belt in November and December.

The year.—The following gives a tabular summary of the meteorological data of the year 1898 for the eleven meteorological provinces of India:—

Mean provincial meteorological data for the year 1898.

METEOROLOGICAL PROVINCE.	Bar. variation.	Mean maximum temperature of year.	Variation of year.	Mean minimum temperature of year.	Variation of year.	Mean daily temperature of year.	Variation of year.	Mean daily range.	Absolute range during year.	Mean monthly absolute range.	Rainfall of year.	Normal rainfall of year.	Variation from normal of year.
Burma Coast and Bay Islands	—026	87.7	+0.3	73.4	+0.2	80.5	+0.3	14.3	38.3	22.9	Inches. 139.14	Inches. 139.34	+ 3.42
Burma Inland . . .	—023	90.9	+0.8	69.1	+0.5	80.0	+0.6	21.7	58.0	33.0	42.31	46.49	— 4.18
Assam	—027	84.3	+1.3	67.0	0	75.7	+0.7	17.2	55.6	29.2	85.88	104.92	—19.0
Bengal and Orissa . . .	—021	86.9	+0.3	69.4	—0.2	78.2	+0.1	17.5	56.9	29.9	75.68	71.63	+ 4.06
Gangetic Plain and Chota Nagpur.	—024	88.4	+0.6	66.9	+0.3	77.6	+0.4	21.5	69.6	35.2	52.33	44.79	+ 7.54
Upper Sub Himalayas . .	—023	88.0	+0.7	63.6	+0.8	75.8	+0.8	24.4	77.8	40.9	35.17	37.82	— 1.30
Indus Valley and North-Western Rajputana.	—023	92.7	+1.6	65.6	+0.7	79.2	+1.2	26.9	80.3	43.3	7.61	9.66	— 2.04
East Rajputana, Central India and Gujarat.	—015	91.9	+1.9	68.1	+1.3	80.0	+1.7	23.7	68.8	38.4	25.73	30.12	— 4.20
Deccan	—008	91.0	+1.1	67.6	+0.8	79.3	+0.9	23.4	65.3	36.4	39.42	41.02	— 1.57
West Coast	—016	86.6	+0.8	74.7	+0.7	80.7	+0.3	12.0	30.5	19.7	105.30	103.13	+ 2.17
South India	—016	90.3	+0.6	72.1	+0.3	81.2	+0.5	18.1	47.5	28.6	42.12	36.61	+ 5.51
Mean of whole India from Table I.	—020	89.0	+0.9	68.9	+0.5	78.9	+0.7	20.1	59.0	32.5	59.15	60.50	— 0.88
Mean of whole India from Table II.	—018	89.1	+1.0	69.0	+0.6	78.0	+0.7	20.1	59.3	...	...	...	...

*A reference to Table I will show that the means in columns 13 and 14 are derived from a smaller number of stations than the means in the twelfth column. The sum of the figures in columns 13 and 14 therefore will not agree with the figures in column 12.

The mean 8 A.M. pressure of the year was in moderate defect over the whole of India by amounts averaging —0.20." It was in defect in all provinces, the deficiency being greatest in Assam and Burma and least in the Deccan. The mean maximum temperature was in excess in all provinces. The excess averaged 0.9 for the whole of India, and was greatest in East Rajputana, Central India and Gujarat (+1.9). It exceeded 1° in the Indus Valley and North-West Rajputana (+1.6), Assam (+1.3) and Deccan (+1.1). The mean minimum or night temperature was in general excess. The excess was less than that in the day temperature, and exceeded 1° only in East Rajputana, Central India and Gujarat (+1.3). The mean temperature of the whole land area was, according to the data of Tables I and II, 0.7 above the normal. The variations for the year were less than 1° in nine out of the eleven meteorological provinces. The mean temperature of the year was 1.7 in excess in East Rajputana, Central India and Gujarat and 1.2 in the Indus Valley and North-West Rajputana. The mean rainfall for the whole of India was in slight defect in the second division of the year and normal or in slight excess in the remaining three divisions and the mean variation for the whole year (taking into consideration the areas represented by the rainfall stations) was +0.43 inch. The rainfall of the year was more or less considerably in

defect over a part of the Indian area. It was between 25 and 48 per cent. below the normal in Baluchistan Hills (48 per cent.), Rajputana West (33 per cent), Berar (32 per cent.) Rajputana East and Central India West (30 per cent.) Assam Surma and South East Punjab (each 26 per cent.)

The following gives a comparison of the actual mean rainfall of India with the normal mean for each year from 1875 to 1898 determined by Mr. Blanford's method:—

YEAR.	Mean actual rainfall.	Variation from normal.	Percentage variation from normal.
	Inches.	Inches.	
1875	43.47	+ 2.38	+ 6
1876	36.60	—4.49	—11
1877	36.81	—4.28	—10
1878	47.43	+6.34	+15
1879	42.78	+1.69	+ 4
1880	39.53	—1.56	— 4
1881	41.19	+0.10	0
1882	43.73	+2.64	+ 6
1883	40.97	—0.12	0
1884	42.82	+1.73	+ 4
1885	42.14	+1.05	+ 3

YEAR.	Mean actual rainfall.	Variation from normal.	Percentage variation.
	Inches.	Inches.	
1886	44'11	+3'02	+ 7
1887	43'51	+2'42	+ 6
1888	39'55	-1'54	- 4
1889	43'50	+2'41	+ 6
1890	41'77	+0'68	+ 2
1891	37'55	-3'54	- 9
1892	45'18	+5'09	+12
1893	50'16	+9'07	+22
1894	47'56	+6'47	+16
1895	38'19	-2'90	- 7
1896	36'26	-4'83	-12
1897	46'94	-0'15	0
1898	41'52	+0'43	+ 1

The preceding table shows that the precipitation of the year was, as in 1897, almost identical with the normal on the mean of the year.

All the more important features of the meteorology of the year have been stated in the preceding discussion. The following gives a very brief summary of the most interesting and important abnormal features with their probable relations to each other.

The chief feature of the cold weather was the absence of well-marked cyclonic storms and the scanty precipitation of the period. This was, as in the preceding cold weather period, only a part of a more general partial failure of the winter rains which extended over Baluchistan, Afghanistan, Persia, Arabia and Asiatic Turkey. It accompanied a remarkable persistency of high pressure conditions in Southern and South-Eastern Europe, and was hence almost certainly due to a persistent displacement of the Russian and Central Asian anti-cyclone produced by conditions quite outside of India. It would be interesting to trace more fully the connection or relation thus indicated, but materials are not as yet available in India for the discussion.

As is almost invariably the rule, the scanty precipitation of the cold weather accompanied higher temperature and greater dryness of the air in that period, and was followed by more pronounced and exaggerated hot weather conditions than usual. Temperature was in large excess in April and the air unusually dry. Frequent feeble depressions originated in Sind and crossed Upper-India in an easterly direction giving numerous series of dust storms in the plains of North-Western India. Similar conditions obtained in Upper India in the first week of May. A depression and disturbance of much greater intensity than usual gave moderately heavy snow in the interior ranges of the Himalayas in the second week of the month. This was followed by a cool wave

of unusual intensity for the period. The effects of the cool wave passed away in the third week of the month, and the last week was abnormally hot and dry.

The general features of the weather during this period were hence directly related to the preceding cold weather conditions.

A noteworthy local feature of this period was the abnormally high temperature, excessive dryness of the air and scanty rainfall in a portion of North-Eastern India, including Cachar and the greater part of East and North Bengal and the Assam Valley. The centre of this dry area was Silchar, which received a total of only 8'82 inches of rain during the period as compared with a normal of 38'06 inches.

The meteorological actions or conditions leading up to this remarkable deficiency in the spring rainfall over Cachar are not at present apparent from the meteorological observations.

The meteorology of the years 1894-97 shows that in these years less snow than usual fell in the Assam Himalayas. In each year this was followed by diminished spring rainfall in Assam and Cachar and was preceded by prolonged monsoon rainfall in Burma (during November and December) and hence also by diminished rain during the retreating south-west monsoon in the Peninsula.

It is noteworthy that a series of relations inverse to the above obtained in the cold weather and summer of 1898-99, viz:—

- (1) Heavier snowfall than the normal in the Assam Himalayas in 1898-99.
- (2) Heavier spring and early monsoon rains in Assam and Cachar in 1899.

This increased precipitation in the Assam region was preceded by an early closure of the monsoon rains in October 1898 over Burma, and by abundant and favourable rain over the southern half of the Peninsula during the retreating south-west monsoon period of October to December 1898.

Future investigation based on fuller and more complete data will show whether these are mere casual coincidences or whether they are related as cause and effect. So far as I can judge from our limited experience and very slight information respecting snowfall in the Eastern Himalayas, I am inclined to believe that these features or conditions are directly related to each other in the order named:—

- (1) Retreating monsoon rainfall in Burma and the Peninsula.
- (2) Winter snowfall in the Eastern Himalayas.
- (3) Spring rains in North-Eastern India.

The character of the pressure anomalies changed in August, and was throughout in general accordance with the distribution of rainfall, the areas of the increased rainfall being generally characterized by negative anomalies and areas of decreased rainfall by positive anomalies. The diversion of the Bombay current from North-Western India was

probably due to the falling off in the general strength of the south-east trades and their continuation. It would be interesting to investigate whether this was produced by actions and conditions in the Indian Ocean at the origin of the current or by the establishment of antagonistic increased pressure and of high pressure conditions in the Persian area and in the north of the Arabian Sea.

During the first two months of the south-west monsoon period conditions were favourable for the extension of both currents to their utmost limits in Upper India. The precipitation during this period was hence general, being normal or in excess in North-Western and Western India and the Deccan, and in defect in North-Eastern India. In August and September the currents were determined more largely to North-Eastern India and Burma than usual, and hence directed less largely to Upper India, with the result that the rainfall was in considerable to large defect in North-Western India and was also below the normal in the Peninsula. It was, on the other hand, more or less in excess in North-Eastern India and Burma.

The meteorology of the south-west monsoon period was approximately normal on the mean of the whole period. The available data indicate that the air movement in the south-east trades was slightly above the normal in June and July, and slightly below it in August and September. The marine data indicate faintly similar variations in the Arabian Sea. To these two periods in the meteorology of the sea areas of the Arabian Sea and Indian Ocean corresponded two divisions of the south-west monsoon in India characterized by marked differences in the distribution of the rainfall.

The general character of the distribution of the monsoon rainfall was in fair accordance with the pressure anomalies and conditions established during the hot weather and well marked at the end of May immediately before the advance of the monsoon currents over the Indian seas into India. The forecast which was chiefly based on a consideration of these pressure anomalies was in very fair accordance with facts, more especially in the following points :—

- (1) The deficient rainfall in Rajputana.
- (2) The abundant rainfall in the North-Western Provinces, Bihar, Bengal and Chota Nagpur.

The abnormal features of the last season of the year, *viz.*, the retreating south-west monsoon period, were peculiarly interesting. At the commencement of the period (the beginning of October) the humid currents were diverted chiefly to North-Eastern India and Burma, where pressure was in relative defect. The only severe cyclonic

storm of the October transition period which formed in the second week of the month was determined to the low pressure area or sink in Bengal. It gave a very heavy burst of rain over the whole of North-Eastern India which drained the supplies of aqueous vapour for some time from the Bay. This storm was hence followed by a short period of very fine dry weather and a considerable local increase of pressure in North-Eastern India and Burma. The establishment of this high pressure in North-Eastern India was followed by the diversion of the retreating currents to the centre and south of the Peninsula. The abnormal pressure conditions thus established were persistent during the remainder of the season and accompanied the early closure of the south-west monsoon rains in Bengal and Burma in October and the occurrence of frequent and abundant rain in the southern half of the Peninsula in the last week of October, November and December.

The most noteworthy feature of this period was the extraordinarily high temperature which prevailed in November and December in a broad belt of country stretching across the head of the Peninsula and including Khandesh, Berar, the Central Provinces and a portion of Central India. The westerly winds in North-Western India were weaker than usual during the period, whilst the prevailing easterly winds in the Deccan were stronger than the normal. The intermediate belt formed an area of light variable winds and calms. Frequent shifts of wind between east and west occurred, accompanied with large changes in the amount of aqueous vapour pressure in the air and also in the amount of cloud. The combination of these conditions, *viz.*—(1) The prevalence of light variable winds alternating between west and east. (2) Large changes of amount of aqueous vapour present in the air, and (3) Increased cloud amount, favoured unusually and abnormally high night temperature and to a considerable less degree higher day temperature than usual. These conditions were most marked during the period 5th to the 15th December. Similar phases of excessive temperature occurred in the months of November and December in the years 1896, 1890 and 1877, and the conditions in these periods were practically identical with those prevailing in the corresponding period of abnormally high temperature in 1898. The sequence of early closure of the monsoon rains in the Central Provinces followed by excessively high temperature in November and December materially injured the cold weather wheat crop in that area.

Appendix.

The following is a brief statement of the hailstorms and earthquakes which occurred during the year 1898 in the North-Western Provinces and Bombay Presidency, the reports of which were received too late to be given in the storm section in the Monthly Weather Reviews of the year :—

Hailstorms.

DATE.	Area affected by storm.	Hour of occurrence.	Duration of storm.	Direction from which it came.	Size or weight of largest stones.	Character of storm.	Estimate of damage caused by storm.
Day, month and year.							
1898	N.-W. P.						
9 Feb.	Banda and Pailani Parganas of the Banda district.	9 P.M.	30 mts.	W	One chhittak.		The standing crops suffered 4 to 12 annas in the rupee.
	BOMBAY.						
13 Feb.	Savnoor State (Dharwar district)	5 P.M.	15 mts.	SE	Pigeon's egg.		No information.
25 Mar.	Two miles on the Hubli-Kumta road and surrounding villages near Tadas.	5 P.M.	10 mts.	NE	Tamarind seed.		Ditto
12 April	Hubli-Santikop road from 75th to 93rd mile.	4½ P.M.	15 mts.	NE	Do.		Ditto
"	Four miles on the Hubli-Kumta and Dharwar-Tadas roads and surrounding villages near Tadas.	5½ P.M.	10 mts.	NE	Do.		Ditto
"	Poona-Bangalore road from mile 246th to 267th.	...	30 mts.	N	½" in diameter		Ditto
"	Dharwar-Haliyal road from mile 1st to 8th.	Between 4 and 5 P.M.	15 mts.	N	Do.		Ditto
"	Dharwar-Saundatti road from mile 2nd to 14th.	Do.	15 mts.	N	Do.		Ditto
"	Dharwar-Tadas road from mile 2nd to 4th.	Do.	30 mts.	SW	Betelnut		Ditto
"	Dharwar-Goa road from mile 1st to 7th.	Do.	30 mts.	SW	Do.		Ditto
18 April	3 miles on the Poona-Bangalore road. (Dharwar District.)	5 P.M.	10 mts.	NE	Do.		Ditto
19 April	Krishna Canal sub-division. (Satara district)	5 30 P.M.	30 mts.		2½" in diameter.		Ditto

DATE.	Area affected by storm.	Hour of occurrence.	Duration of storm.	Direction from which it came.	Size or weight of largest stone.	Character of storm.	Estimate of damage caused by storm.
Day, month and year.							
1898							
19 April	2 square miles on the top of Phonda Ghat in the Devgad taluka, Ratnagiri District.		30 mts.		Betelnut		No information.
20 April	Belgaum-Karwar road 41st to 53rd mile.	4 P.M.			1½" in diameter.	Moderately severe.	Ditto.
21 April	From Supa to Birchi on the Haliyal-Supa road and from 2nd to 8th mile of the Karka-Shamjorda road (Kanara district.)	4 P.M.	30 mts.		1½" in diameter	Moderately severe.	Ditto.
28 April	Dharwar-Saundatti road from mile 2nd to 14th.	Between 4 and 5 P.M.	15 mts.	N	½" in diameter		Ditto.
"	Dharwar-Goa road from mile 49th to 58th and up to 2 miles on both sides of the road.	Between 4 and 5 P.M.	30 mts.		Small		Ditto.
"	Anmol-Hunadji road from 37th to 39th.	Between 4 and 5 P.M.	30 mts.		Small		Ditto.
"	Castle rock and up to 3 miles round the village.	Between 4 and 5 P.M.	30 mts.		Small		Ditto.
1 May	Poona-Bangalore road from 272nd to 276th mile. (Dharwar district.)	6 P.M.	8 mts.	NE	Betelnut		Ditto.
"	Hubli-Kunnur road from 8th to 12th Mile. (Dharwar.)	5 P.M.	10 mts.	NE	Betelnut		Ditto.
18 May	15 square miles in the Saundatti taluka. (Belgaum district)	...	5 mts.	N	Small		Ditto.
22 May	Dharwar-Haliyal road from mile 8th to 17th.	Between 4 and 5 P.M.	30 mts.	W	1½" in diameter		Ditto.
"	Dharwar-Tadas road, miles 2nd, 3rd, 6th and 7th	Do.	30 mts.		Small		Ditto.
23 May	15 square miles in the Saundatti taluka (Belgaum district).	...	5 mts.	W	1½" in diameter		Ditto.
24 May	Do. do.	...	30 mts.	W	Do.		Ditto.
"	97 square miles in 5 villages of the Belgaum district.	...	30 mts.	E	1½" in diameter		Ditto.

DATE. Day, month and year.	Area affected by storm.	Hour of occurrence.	Duration of storm.	Direction from which it came.	Size or weight of largest stones.	Charac- ter of storm.	Estimate of damage caused by storm.
1898. 25 May	Mahableshwar (Satara district).	...	3 hours.		$\frac{3}{4}$ " in dia- meter.		No in- formation.
26 May	Mundgod and Pala.	4 P.M.	5 mts.		Betelnut.	Feeble	Ditto.
" "	5 villages of the Mahad taluka of the Kolaba district.	...	10 to 15 mts.		1" in dia- meter.		Ditto.
28 May	Poona-Bangalore road from mile 248th to 267th.	Between 4 and 5 P.M.	15 mts.	N	$\frac{1}{2}$ " in dia- meter.		Ditto.
" "	Dharwar-Haliyal road from mile 1st to 12th.	Between 4 and 5 P.M.	15 mts.	N	$\frac{1}{2}$ " in dia- meter.		Ditto.
" "	Dharwar-Tadas road, mile 2 and 3.	Between 4 and 5 P.M.	15 mts.		Small		Ditto.

DATE. Day, month and year.	Area affected by storm.	Hour of occurrence.	Duration of storm.	Direction from which it came.	Size or weight of largest stones.	Charac- ter of storm.	Estimate of damage caused by storm.
1898. 1st June	Sirsi sub-division of the Kanara district.	5-30 P.M.	5 mts.		Betelnut		No infor- mation.
2nd June	Navalgand and Sholapur-Hubli roads and in six villages.		30 mts.		1" in dia- meter.		Ditto.
Report of earthquake dated		Place of occurrence.		Authority from which the report was received.			
13th January 1898		Mount Abu		Superintendent, Meteorological Observatory, Mount Abu.			
25th Do.		Do.		do. do. do.			
16th February		Do.		do. do. do.			
10th March		Do.		do. do. do.			
23rd September		Sambhar		Observer do. Sambhar			
25th October		Mount Abu		Superintendent Meteorological Observatory, Mount. Abu.			

Table

Abstract of observations taken at 8 A.M.

Number of District.	METEOROLOGICAL PROVINCE OR DISTRICT.	STATION.	Elevation of Bar Cistern above sea level in feet.	PRESSURE 8 A.M. IN INCHES.							TEMPERATURE OF AIR.											
				Mean actual pressure reduced to 32°.	Variation from normal.	Mean pressure reduced to sea level and to constant gravity 45° Lat.	Highest pressure recorded during year.	Lowest pressure recorded during year.	Absolute range during year.	Mean monthly range of pressure.	Mean of 8 A.M. of year.	Mean maximum of year.	Variation from normal of year.	Mean minimum of year.	Variation from normal of year.	Mean daily temperature of year.	Variation from normal of year.	Mean daily range of temperature.	Highest temperature observed during year.	Lowest temperature observed during year.	Absolute range during year.	Mean monthly absolute range.
I.—Burma Coast and Bay Islands				...	...	-.026	...	...	...	...	...	87.7	+0.3	73.4	+0.2	80.5	+0.3	14.3	...	...	38.0	22.8
1	TENASSERIM AND BAY ISLANDS.	Car Nicobar . .	25	29.859	?	29.811	30.041	29.714	.327	.145	79.6	86.1	?	76.2	?	81.1	?	9.9	91.4	68.2	23.2	16.7
		Port Blair . .	61	29.838	?	29.830	30.066	29.612	.394	.165	79.9	86.8	?	76.9	?	81.8	?	9.9	93.4	69.3	24.1	17.6
		Mergui . .	96	29.828	?	29.856	30.021	29.632	.389	.167	78.0	87.4	?	72.7	?	80.1	?	14.7	97.6	60.3	37.3	21.5
		Tavoy . .	26	29.886	-.037	29.843	30.085	29.643	.442	.183	75.6	87.7	0	71.1	0	79.4	0	16.6	97.7	51.2	43.5	26.0
		Moulmein . .	94	29.802	-.031	29.835	30.068	29.540	.528	.197	76.1	88.1	+0.1	72.5	+0.4	80.3	+0.3	15.6	99.4	54.4	45.0	25.4
2	LOWER BURMA .	Rangoon . .	41	29.853	-.026	29.831	30.115	29.579	.536	.206	76.1	89.7	+0.6	72.3	?	81.0	?	17.4	102.7	59.8	42.9	25.5
		Bassein . .	27	29.866	-.017	29.829	30.127	29.599	.528	.208	76.5	88.1	+0.2	72.8	+1.0	80.5	+0.6	15.3	99.2	59.3	30.9	23.7
		Diamond Island .	41	29.851	-.019	29.827	30.086	29.578	.508	.198	80.6	85.4	?	76.6	?	81.1	?	8.8	97.6	69.4	28.2	16.5
5	ARAKAN . .	Akyab . .	20	29.854	-.025	29.815	30.124	29.501	.623	.225	75.7	86.4	+0.1	71.8	-.04	79.1	-.02	14.6	97.9	53.2	44.7	24.3
8	CENTRAL BURMA .	Toungoo . .	183	29.697	-.024	29.824	29.959	29.417	.542	.206	75.3	91.2	+1.1	70.9	+0.3	81.1	+0.7	20.3	105.7	54.1	51.6	31.0
II.—Burma Inland . .				...	...	-.023	...	...	...	...	...	90.9	+0.8	69.1	+0.5	80.0	+0.6	21.7	...	...	58.0	33.0
3	CENTRAL BURMA .	Thayetmyo . .	134	29.743	-.020	29.821	30.038	29.442	.596	.210	76.7	92.6	+0.9	69.6	+0.2	81.1	+0.6	23.0	107.1	48.2	58.9	33.2
4	UPPER BURMA .	Minbu . .	165	29.706	-.027	?	30.017	29.406	.611	.227	76.4	92.6	+0.7	71.5	+0.7	82.1	+0.6	21.1	108.1	51.5	56.6	32.2
		Yamethin . .	657	29.213	?	29.828	29.499	28.939	.560	.225	75.6	92.4	+0.4	69.3	+0.8	80.9	+0.6	23.1	106.5	50.7	55.8	33.7
		Mandalay . .	250	29.613	-.022	29.818	29.902	29.323	.579	.235	77.6	93.2	+1.1	71.6	+0.8	82.4	+0.9	21.6	108.1	52.2	55.9	32.9
		Kindat . .	377	29.471	?	?	29.858	29.119	.739	.277	71.7	87.3	+0.5	67.2	0	77.3	+0.3	20.1	106.3	41.5	60.8	32.4
		Bhamo . .	381	29.492	?	?	29.833	29.208	.625	.263	70.2	87.1	+1.0	65.6	+0.6	76.4	+0.8	21.5	104.1	43.9	60.2	33.5
(a)	BURMA HILL STATIONS.	Maymyo . .	...	...	Not recorded.	...	...	...	...	66.7	78.5	?	52.4	?	65.4	?	26.1	91.4	32.0	59.4	35.2	
		Taunggyi . .	...	...	Not recorded.	...	...	...	...	65.9	77.3	?	56.2	?	66.8	?	21.1	94.1	36.5	57.6	31.2	
		Lashio . .	...	27.117	-.002	?	27.332	26.868	.464	.207	64.7	83.7	+2.0	59.9	+0.4	71.8	+1.2	23.8	98.5	41.1	57.4	34.3
III.—Assam . .				...	...	-.027	...	...	...	...	...	84.3	+1.3	67.0	0	75.7	+0.7	17.2	...	...	55.6	29.2
7	SURMA . .	Silchar . .	104	29.775	...	29.833	30.146	29.395	.751	.271	72.8	88.1	+2.4	67.4	0	77.8	+1.2	20.7	101.6	44.5	57.1	32.6
9	BRAHMAPUTRA .	Sibsagar . .	333	29.543	-.026	29.842	29.972	29.178	.794	.298	69.2	81.5	-.06	65.5	?	73.5	?	16.0	95.7	40.0	55.7	28.5
		Dhubri . .	115	29.734	-.027	29.807	30.094	29.285	.809	.287	72.0	83.2	+0.2	68.2	0	75.7	+0.1	15.0	98.7	44.8	53.9	26.6
IV.—Bengal and Orissa . .				...	...	-.021	...	...	...	...	...	86.9	+0.3	69.4	0.2	78.2	+0.1	17.5	...	...	56.9	29.9
6	EAST BENGAL .	Chittagong . .	87	29.769	-.026	29.806	30.078	29.376	.702	.248	75.9	85.8	+0.8	70.0	-.08	77.9	0	15.8	96.2	49.9	46.3	27.5
		Noakhali . .	43	29.808	?	29.799	30.131	29.432	.702	.255	74.7	84.5	?	67.4	?	76.0	?	17.1	94.5	44.0	50.5	29.3
		Comilla . .	36	29.816	?	29.800	30.136	29.432	.704	.261	75.0	87.5	?	68.1	?	77.8	?	19.4	101.3	48.1	55.2	31.3
		Sirajganj . .	49	29.777	?	29.776	30.122	29.349	.773	.282	72.7	85.9	?	67.9	?	77.0	?	18.0	104.9	43.6	61.3	31.1
		Narayanganj .	26	29.817	-.022	29.792	30.150	29.413	.737	.275	74.6	86.1	-.04	70.5	+0.2	78.3	-.01	15.6	99.1	49.2	49.9	26.7
		Barisal . .	13	29.822	-.025	29.781	30.150	29.421	.729	.263	76.1	86.1	+0.9	69.9	-.02	78.0	+0.4	16.2	100.1	46.2	54.1	27.5
		Mymensingh .	59	29.785	-.021	29.797	30.126	29.381	.745	.265	73.4	84.7	+0.3	68.6	+0.7	76.7	+0.5	16.1	100.6	46.4	54.5	28.4
		Faridpur . .	46	29.797	?	29.792	30.142	29.391	.751	.276	73.2	86.2	?	68.5	?	77.4	?	17.7	102.8	45.5	57.3	29.7
		Jessore . .	33	29.803	-.021	29.783	30.161	29.355	.806	.279	75.3	87.8	+0.1	69.3	-.07	78.6	-.04	18.5	106.0	45.1	60.9	31.7
		Calcutta . .	21	29.814	-.018	29.781	30.191	29.327	.864	.289	75.1	86.5	+0.2	69.9	-.06	78.2	-.02	16.6	103.4	48.2	55.2	29.3
10	DELTAIC BENGAL .	Saugor Island .	25	29.800	-.028	29.769	30.184	29.307	.877	.281	77.3	85.8	+0.4	73.1	-.06	79.5	-.01	12.7	97.9	51.0	46.9	24.6
		Krishnagar . .	47	29.790	?	29.786	30.165	29.333	.832	.288	75.2	88.3	?	68.3	?	78.3	?	20.1	107.2	43.2	64.0	33.2
		Midnapore . .	149	29.678	?	29.777	30.068	29.224	.844	.292	76.0	90.8	?	70.0	?	80.4	?	26.7	111.4	46.1	65.3	33.7
		Bankura . .	258	29.500	?	29.754	29.908	29.003	.905	.298	74.7	90.0	?	69.7	?	79.9	?	20.2	111.6	46.3	68.3	33.8
		Raiganj . .	334	29.487	?	29.777	29.880	28.985	.895	.300	73.7	89.7	?	68.7	?	79.2	?	21.6	114.5	45.4	69.1	34.2

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at 215 stations in India, Burma, etc., in the year 1898.

WIND DIRECTION.										WIND VELOCITY.			HYGROMETRY, 8 A.M.		Mean cloud amount of year.	RAINFALL.						Heaviest rainfall during year.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	
Number of winds from										Mean velocity in miles per hour.	Normal.	Percentage variations.	Mean humidity of year.	Mean vapour tension of year.		Number of rainy days during year.	Normal number of rainy days during year.	Variation.	Rainfall of year.	Normal rainfall of year.	Variation from normal of year.				
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.																	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	139.27	139.34	+3.42	...	I.—Burma Coast and Bay Islands.		
17	33	30	23	27	21	57	93	64	7.7	7.4	+4	86	.869	7.8	129	?	?	107.85	?	?	5.96	Car Nicobar	TENASSERIM AND BAY ISLANDS.	1	
291	12	11	4	5	8	11	9	14	1.4	1.8	-22	86	.810	4.6	148	?	?	127.21	116.98	+10.23	9.88	Port Blair			
319	5	7	...	2	1	15	...	16	1.0	?	?	89	.808	3.8	135	?	?	150.69	166.42	-15.73	4.97	Mergui.			
...	30	57	71	64	58	42	25	13	2.9	2.8	+4	88	.795	4.9	134	137.55	-3.55	194.70	199.08	-4.38	8.13	Tavoy.			
...	17	35	38	24	61	107	67	16	3.3	4.6	-28	88	.830	5.2	125	116.89	+8.11	206.94	181.34	+25.60	10.02	Moulmein.	LOWER BURMA	2	
80	17	37	14	32	36	42	18	89	4.6	3.7	+24	88	.816	4.1	123	131.54	-8.54	109.05	95.27	+13.78	4.12	Rangoon			
21	67	62	34	13	22	62	40	44	10.9	7.4	+47	78	.824	5.7	104	120.44	-16.44	125.42	109.55	+15.87	10.75	Bassein.			
19	72	98	71	41	33	18	6	7	3.4	3.2	+6	88	.803	4.5	109	120.09	-11.09	102.09	118.66	-16.57	5.05	Diamond Island.			
104	42	12	12	87	66	8	4	30	2.9	3.1	-6	86	.778	4.7	106	112.63	-6.63	193.92	186.98	+6.94	14.97	Akyab	ARAKAN.	5	
...	74.85	79.77	-4.92	2.56	Toungoo.		CENTRAL BURMA.	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	42.31	46.49	-4.18	...	II.—Burma Inland.		
...	46	17	25	30	187	19	21	20	6.6	5.1	+29	74	.705	3.9	63	76.08	-13.08	28.29	37.67	-9.38	2.22	Thayetmyo	CENTRAL BURMA.	3	
54	14	2	17	148	37	7	24	62	10.6	?	?	73	.691	4.0	50	?	?	25.66	28.06	-2.40	1.53	Mimbu		UPPER BURMA.	4
66	20	12	...	140	91	...	...	36	5.7	?	?	80	.724	2.8	73	?	?	42.81	34.49	+8.32	2.85	Yamethin.		
92	17	26	9	44	115	51	3	7	3.4	?	?	76	.724	4.1	37	?	?	23.75	33.69	-9.94	3.41	Mandalay.			
145	64	19	14	25	27	19	29	23	2.0	?	?	93	.762	4.7	93	?	?	60.94	71.58	-10.64	4.65	Kindat.			
212	29	50	7	4	5	27	15	16	2.6	?	?	88	.671	4.9	98	?	?	72.40	73.43	-1.03	3.91	Bhamo.			
122	11	30	6	9	29	109	38	11	?	?	?	80	.529	?	80	?	?	47.69	?	?	2.76	Maymyo	BURMA HILL STATIONS.	4(a)	
41	5	6	3	70	135	92	10	3	?	?	?	75	.491	5.7	96	?	?	53.05	67.40	-14.35	3.43	Taunggyi.			
...	...	...	...	...	...	...	...	...	?	?	?	88	.551	7.9	78	?	?	52.07	58.07	-6.00	3.45	Lashio.		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	85.88	104.92	-19.05	...	III.—Assam.		
289	2	11	39	11	1	2	8	2	2.0	2.7	-26	86	.728	5.5	106	138.69	-32.69	76.34	125.33	-48.99	5.59	Silchar	SURMA.	7	
191	44	48	7	6	9	42	11	6	2.8	2.4	+17	95	.711	7.0	132	129.16	+2.84	89.19	96.09	-6.92	2.83	Sibsagar		BRAHMAPUTRA.	8
39	19	89	138	19	22	26	8	5	5.3	4.7	+13	86	.704	4.4	96	92.14	+3.86	92.10	93.33	-1.23	6.33	Dhubri.			
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	75.68	71.63	+4.06	...	IV.—Bengal and Orissa.		
52	36	85	29	199	47	14	...	3	6.5	5.1	+27	86	.781	4.2	78	98.83	-20.83	102.30	105.25	-2.95	5.36	Chittagong	EAST BENGAL.	6	
...	63	59	44	71	34	58	14	22	3.8	?	?	87	.776	4.1	104	107.63	-3.63	140.62	118.92	-21.70	7.90	Noakhali.			
120	22	14	37	88	67	4	4	5	3.9	?	?	80	.718	4.4	90	101.97	-11.97	78.72	89.39	-10.67	7.45	Comilla.			
82	28	21	48	51	49	23	14	18	2.6	?	?	88	.741	4.5	81	78.65	+2.35	71.04	61.55	+9.49	6.50	Sirajganj.(a)			
47	33	22	34	78	70	32	16	33	4.5	4.5	0	86	.775	5.1	87	94.57	-7.57	73.69	73.70	-0.01	8.16	Narayanganj.	DELTAIC BENGAL.	10	
172	17	19	9	44	60	28	7	9	1.9	?	?	83	.785	4.4	91	99.81	-8.81	73.79	77.95	-4.16	3.05	Barisal			
162	1	4	72	100	8	5	9	4	?	?	?	85	.736	?	97	104.27	-7.27	100.70	75.06	+25.64	6.99	Mymensingh.			
215	10	...	9	51	66	10	2	...	1.6	?	?	88	.762	3.3	85	89.31	-4.31	76.74	68.54	+8.20	4.82	Faridpur.			
193	16	9	11	51	30	35	5	15	2.8	3.2	-13	84	.769	4.4	88	88.78	-0.78	74.98	65.46	+9.52	4.16	Jessore.	CENTRAL BENGAL.	11	
85	34	19	27	40	47	73	23	17	3.9	4.8	-19	83	.759	4.2	81	85.32	-4.32	59.52	61.46	-1.94	3.31	Calcutta.			
1	64	61	12	27	83	66	20	28	11.6	10.8	+8	85	.817	5.2	64	83.10	-19.10	67.65	70.98	-3.33	9.71	Saugor Island.			
18	21	10	44	52	84	26	58	52	4.5	?	?	80	.737	3.8	73	74.27	-1.27	65.72	54.04	+11.68	4.21	Krishnagar.			
115	77	25	2	14	106	4	2	20	2.8	?	?	74	.700	3.0	71	75.92	-4.92	59.18	55.91	+3.27	3.57	Midnapore.			
202	4	7	33	39	21	6	42	9	3.0	?	?	75	.677	3.4	68	79.08	-11.08	62.49	56.26	+6.23	12.48	Bankura			
137	11	13	33	24	24	22	45	56	2.1	?	?	74	.655	3.1	67	73.07	-6.07	67.56	54.30	+13.26	6.24	Raniganj.			

* Mean of 12 months.

(a) Wind observations of 334 days.

Table

Abstract of observations taken at 8 A.M.

Number of District.	METEOROLOGICAL PROVINCE OR DISTRICT.	STATION.	Elevation of Bar Cistern above sea level in feet.	PRESSURE 8 A.M. IN INCHES.							TEMPERATURE OF AIR.											
				Mean actual pressure reduced to 32°.	Variation from normal.	Mean pressure reduced to sea level and to constant gravity 45° Lat.	Highest pressure recorded during year.	Lowest pressure recorded during year.	Absolute range during year.	Mean monthly range of pressure.	Mean of 8 A.M. of year.	Mean maximum of year.	Variation from normal of year.	Mean minimum of year.	Variation from normal of year.	Mean daily temperature of year.	Variation from normal of year.	Mean daily range of temperature.	Highest temperature observed during year.	Lowest temperature observed during year.	Absolute range during year.	Mean monthly absolute range.
11	CENTRAL BENGAL.	Burdwan . . .	99	29.734	-.018	29.782	30.114	29.246	.868	.297	75.4	89.7	+0.9	70.2	-.02	80.0	+0.4	19.5	110.6	49.8	60.8	32.1
		Naya Dumka . .	488	29.329	?	29.785	29.711	28.876	.885	.294	74.8	87.9	?	67.6	?	77.8	?	20.3	112.0	44.0	68.0	33.9
		Berhampore . .	67	29.764	-.022	29.780	30.146	29.300	.846	.295	73.8	85.5	-.05	69.4	-.01	77.5	-.02	16.0	108.1	47.6	60.5	27.5
		Rampur Boalia .	70	29.759	?	29.779	30.140	29.289	.851	.289	74.7	86.7	?	68.9	?	77.8	?	17.8	108.8	47.1	61.7	30.7
		Malda . . .	72	29.751	?	29.776	30.151	29.263	.888	.303	73.3	87.3	?	67.3	?	77.3	?	20.0	107.1	44.2	62.9	32.9
		Bogra . . .	61	29.770	?	29.785	30.145	29.321	.824	.283	72.9	86.4	+0.4	68.3	+0.6	77.4	+0.5	18.1	105.6	46.7	58.9	31.0
12	NORTH BENGAL.	Dinajpur . . .	123	29.711	?	29.792	30.103	29.237	.866	.297	72.4	86.1	+0.2	66.8	0	76.5	+0.1	19.3	104.3	41.5	62.8	32.8
		Rangpur . . .	123	29.721	?	29.801	30.087	29.270	.817	.292	74.6	85.9	?	69.5	?	77.7	?	16.4	99.2	45.2	54.0	29.3
		Jalpaiguri . .	284	29.552	-.021	29.801	29.938	29.145	.793	.293	71.1	83.8	-.01	66.7	?	75.3	?	17.1	97.4	45.1	52.3	28.3
		Cooch Behar . .	156	29.683	?	29.795	30.037	29.281	.756	.290	71.8	84.0	?	67.4	?	75.7	?	16.6	96.4	45.9	50.5	27.8
17	NORTH BIHAR.	Purnea . . .	125	29.710	?	29.792	30.143	29.285	.857	.305	71.3	86.4	-.04	66.8	+0.8	76.6	+0.2	19.6	105.3	43.5	61.8	32.4
14	ORISSA . . .	Balasore . . .	46	29.788	?	29.781	30.178	29.342	.836	.288	75.7	89.4	+1.6	66.9	-.03	79.7	+0.7	19.5	106.5	46.4	60.1	32.3
		False Point . .	21	29.820	-.017	29.782	30.200	29.340	.860	.290	77.1	85.8	-.01	71.3	-.07	78.6	-.04	14.5	99.5	48.0	51.5	27.1
		Cuttack . . .	80	29.760	-.015	29.783	30.150	29.263	.887	.281	75.6	91.5	+0.1	72.0	-.04	81.8	-.02	19.5	110.5	50.1	60.4	32.2
		Shortt's Island .	?	29.806	?	...	30.178	29.332	.846	.296	79.5	85.7	?	75.7	?	80.7	?	10.0	97.6	61.0	36.6	20.5
		Puri . . .	20	29.825	?	29.787	30.209	29.347	.862	.282	78.2	86.8	?	74.1	?	80.5	?	12.7	95.7	56.1	41.6	24.1
	V.—Gangetic Plain and Chota Nagpur.			...	-.024	...	...	...	...	...	...	88.4	+0.6	66.9	+0.3	77.6	+0.4	21.5	...	...	69.6	35.2
15	CHOTA NAGPUR.	Hazaribagh . .	2,007	27.800	-.027	29.776	28.151	27.412	.739	.267	72.0	85.0	+0.6	65.9	+0.6	75.5	+0.6	19.0	108.6	40.4	68.2	32.4
		Ranchi . . .	2,128	27.693	?	29.785	28.025	27.286	.739	.267	72.2	84.8	+1.0	65.5	+1.0	75.2	+1.0	19.3	107.5	40.5	67.0	22.1
		Daltonganj . .	730?	29.089	?	29.790	29.535	28.711	.824	.273	72.4	90.3	?	64.6	?	77.5	?	25.7	113.6	35.2	78.4	39.9
		Chaibassa . .	760	29.057	?	29.780	29.436	28.523	.913	.299	73.6	91.0	+1.1	68.4	-.02	79.7	+0.5	22.6	113.9	42.9	71.0	35.5
16	SOUTH BIHAR.	Gaya . . .	375	29.434	-.029	29.771	28.878	28.977	.901	.292	75.0	90.9	+1.0	68.9	+0.2	79.9	+0.6	22.0	113.5	44.0	69.5	34.3
		Dehri . . .	351	29.454	?	29.766	29.915	28.938	.977	.302	75.3	89.6	?	69.6	?	79.6	?	20.0	113.5	45.1	68.4	33.4
		Patna . . .	183	29.633	-.032	29.773	30.078	29.226	.852	.304	74.1	87.5	-.02	68.7	+0.5	78.1	+0.2	18.8	110.0	45.2	64.8	33.0
		Arrah . . .	190	22.613	?	29.759	30.065	29.200	.865	.311	73.4	88.9	?	66.8	?	77.9	?	22.1	111.0	40.3	70.7	35.2
		Buxar . . .	239	29.568	?	29.767	30.029	29.161	.868	.298	74.5	88.7	?	67.9	?	78.3	?	20.9	110.8	41.9	68.9	34.3
17	NORTH BIHAR.	Bhagalpur . .	160	29.658	?	28.774	30.089	29.236	.853	.301	74.8	87.8	?	67.6	?	77.7	?	20.2	112.8	42.8	70.0	34.1
		Darbhanga . .	166	29.650	-.031	29.774	30.082	29.243	.839	.302	73.2	83.6	-.01	68.5	-.01	75.5	0	16.3	98.3	46.8	51.5	28.3
		Muzaffarpur . .	178	29.633	?	29.769	30.063	29.233	.830	.306	73.1	86.1	?	67.0	?	76.6	?	19.0	106.2	43.8	62.4	32.1
		Motihari . . .	224	29.597	?	29.785	30.038	29.172	.866	.317	71.4	85.9	?	65.2	?	75.6	?	20.6	105.0	40.0	65.0	33.4
		Chapra . . .	181	29.639	?	29.778	30.088	29.237	.851	.305	73.6	88.2	?	67.8	?	78.0	?	20.4	109.7	43.0	66.7	33.0
18	N.W. PROVINCES (EAST).	Benares . . .	267	29.551	-.013	29.781	30.009	29.163	.846	.285	72.4	89.4	0	66.1	?	77.7	?	23.3	112.8	37.6	75.2	37.8
		Allahabad . .	309	29.504	-.021	29.774	29.952	29.117	.835	.280	74.2	90.2	+0.3	66.6	+0.1	78.5	+0.2	23.6	113.7	38.9	74.8	38.0
22	N.W. PROVINCES (EAST SUBMONTANE).	Gorakhpur . .	256	29.545	-.025	29.765	29.982	29.104	.878	.296	73.1	?	?	67.0	-.02	?	?	?	109.6	43.6	66.0	?
19	SOUTH OUDH . .	Lucknow . . .	368	29.438	-.023	29.774	29.892	29.018	.874	.290	72.2	90.1	+0.5	66.0	+0.7	78.1	+0.6	24.0	113.8	37.6	76.2	38.9
20	NORTH OUDH . .	Bahraich . . .	403	29.358	?	29.771	29.837	28.951	.885	.300	73.0	88.6	?	65.6	?	77.1	?	22.9	111.6	38.6	73.0	38.3
21	N.W. PROVINCES (CENTRAL).	Cawnpore . . .	416	29.390	-.018	29.770	29.839	28.974	.865	.283	73.6	90.5	+1.1	66.1	-.01	78.4	+0.5	24.4	114.1	36.5	77.6	39.8
		Mainpuri . . .	516	29.282	?	29.769	29.739	28.860	.879	.288	72.0	90.0	?	65.7	?	77.9	?	24.4	113.2	36.0	77.2	39.7
	VI.—Upper Sub-Himalayas			...	-.023	...	...	...	...	...	...	88.0	+0.7	63.6	+0.8	75.8	+0.8	24.4	...	...	77.8	40.9
24	N.W. PROVINCES (WEST SUBMONTANE).	Bareilly . . .	568	29.233	-.011	29.780	29.673	28.790	.883	.303	70.8	87.2	-.03	64.8	+0.4	76.0	0	22.4	111.5	37.2	74.3	38.1
		Dehra Dun . .	2,233	27.575	-.030	29.797	27.938	27.197	.741	.287	66.2	81.6	+0.9	60.9	-.01	71.3	+0.4	20.8	102.5	38.5	64.0	34.6
		Roorkee . . .	887	28.902	-.024	29.782	29.321	28.469	.852	.298	68.5	87.1	-.01	62.0	-.05	74.6	-.03	25.0	109.7	33.8	75.9	40.1

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at 215 stations in India, Burma, etc., in the year 1898—contd.

WIND DIRECTION.									WIND VELOCITY.			HYGROMETRY, 8 A.M.		RAINFALL.							Heaviest rainfall during year.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Number of winds from									Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity of year.	Mean vapour tension of year.	Mean cloud amount of year.	Number of rainy days during year.	Normal number of rainy days during year.	Variation.	Rainfall of year.	Normal rainfall of year.	Variation from normal of year.				
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.																
207	16	6	11	7	18	40	13	16	14	33	-58	78	728	41	67	78'60	-11'60	63'48	55'13	+ 8'35	5'07	Burdwan,	CENTRAL BENGAL.	12
111	20	15	38	45	35	21	17	63	17	?	?	71	638	39	77	80'15	-3'15	64'62	57'64	+ 6'98	3'50	Naya Dumka,		
138	18	5	39	28	68	37	21	11	31	35	-11	82	724	40	71	79'22	-8'22	78'97	55'97	+23'00	7'97	Berhampore,		
123	29	12	49	42	45	35	13	17	40	?	?	82	749	35	71	74'85	-3'85	68'46	56'50	+11'96	5'11	Rampur Boalia,		
...	57	40	38	55	66	28	49	32	23	?	?	81	701	35	70	69'31	+0'69	56'92	55'37	+ 1'55	4'26	Malda,		
					Not recorded.							84	719	42	84	81'51	+2'49	79'09	67'41	+11'68	5'43	Bogra,	NORTH BENGAL.	12
7	26	59	92	62	24	29	33	33	41	?	?	82	689	42	82	76'91	+5'09	73'94	69'90	+ 4'04	4'53	Dinajpur		
85	7	57	89	26	38	9	16	5	26	?	?	86	768	36	92	80'33	+11'67	88'46	82'18	+ 6'28	6'62	Rangpur, (a)		
9	57	72	85	51	16	14	28	33	21	?	?	87	688	23	97	100'81	-3'81	127'48	127'76	-0'28	7'38	Jaipalguri,		
142	17	52	64	60	28	1	...	1	17	?	?	88	713	55	104	?	?	124'87	131'13	-6'16	7'03	Cooch Behar,		
76	13	49	115	24	15	33	22	18	41	24	+70	84	683	41	69	70'60	-1'60	67'21	64'17	+3'04	12'54	Purnea,	NORTH BIHAR.	17
96	37	14	6	2	33	111	20	46	40	?	?	82	770	30	59	82'32	-23'32	51'24	65'56	-14'32	6'78	Balasure		
13	43	4	11	7	30	95	73	89	77	91	-15	85	820	53	65	74'44	- 9'44	64'85	69'87	- 5'02	7'01	False Point,	ORISSA.	14
131	15	29	12	4	21	73	67	13	30	29	+ 3	80	736	37	66	76'99	-10'99	47'75	63'42	-15'67	4'52	Cuttack,		
...	53	29	14	6	59	106	56	42	155	?	?	78	805	34	57	?	?	71'02	52'99	+18'03	8'08	Shortt's Island,	V.—Gangetic Plain and Ohota Nagpur.	15
59	92	32	7	3	5	92	47	27	112	?	?	82	817	33	53	66'23	-13'23	43'07	56'62	-13'55	5'16	Puri,		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	52'33	44'79	+7'54	...	V.—Gangetic Plain and Ohota Nagpur.
36	26	7	26	22	49	64	88	47	78	68	+15	64	512	38	63	76'10	-13'10	54'96	52'38	+2'58	5'79	Hazaribagh		
50	13	13	24	18	51	65	52	78	68	?	?	65	524	33	77	82'99	-5'99	56'80	56'47	+0'33	6'52	Ranchi,		
76	15	9	36	14	81	82	42	10	42	?	?	69	566	23	55	63'31	-8'31	40'51	45'48	-4'97	3'75	Daltonganj,	SOUTH BIHAR.	16
164	7	9	7	4	11	57	78	25	38	?	?	74	643	18	59	76'20	-17'20	50'85	54'10	- 3'25	3'75	Chaibassa,		
106	1	40	20	52	43	68	29	6	62	25	+148	68	577	30	62	57'26	+4'74	45'59	44'95	+ 0'64	4'96	Gaya		
12	4	5	45	30	78	136	41	12	73	?	?	66	587	25	53	54'84	-1'84	50'74	43'11	+ 7'63	4'28	Dehri		
64	1	25	98	27	21	36	79	14	43	30	+43	73	653	32	60	55'23	+4'77	61'97	45'13	+16'84	5'03	Patna,		
48	12	16	63	46	36	51	58	35	36	?	?	74	644	24	51	57'06	-6'06	56'39	43'88	+12'51	5'60	Arrah,	NORTH BIHAR.	17
29	7	9	111	25	16	36	109	20	51	?	?	67	603	28	55	54'82	+6'18	46'08	41'89	+4'19	2'71	Buxar		
158	6	30	43	45	25	41	14	2	26	?	?	72	658	36	64	61'01	+2'99	67'42	46'73	+20'69	5'85	Bhagalpur,		
33	8	15	101	82	27	26	45	27	41	38	+8	80	687	28	63	58'46	+4'54	52'26	48'09	+3'27	3'81	Darbhanga,		
190	...	18	70	45	3	3	19	16	51	?	?	81	692	23	64	56'07	+7'93	65'19	47'24	+17'95	6'66	Muzaffarpur		
...	14	75	147	8	9	31	42	38	53	?	?	85	690	14	66	56'43	+9'57	64'64	52'98	+11'66	8'45	Motihari	N.W. PROVINCES (EAST).	18
142	...	10	81	36	7	41	36	12	29	?	?	76	655	29	62	52'25	+9'75	55'43	42'43	+13'00	4'53	Chapra,		
109	7	17	45	26	9	75	69	8	36	39	-8	72	611	30	51	50'54	+0'46	47'91	39'43	+8'48	5'58	Benares		
19	15	27	69	24	16	43	105	47	61	46	+33	68	603	32	52	48'47	+3'53	54'60	39'44	+15'16	4'44	Allahabad		
53	50	90	38	18	19	20	38	39	22	25	-12	76	654	32	65	52'29	+12'71	62'42	51'35	+11'07	5'87	Gorakhpur		
171	11	11	64	14	7	11	62	14	20	31	-35	72	593	29	50	46'83	+3'17	45'62	38'80	+6'82	3'82	Lucknow	N.W. PROVINCES (EAST SUBMONTANE).	23
120	10	11	77	69	2	8	16	51	23	?	?	73	628	17	53	?	?	37'56	40'94	-3'38	2'82	Bahraich		
127	13	16	45	26	7	44	70	17	31	?	?	65	562	22	44	41'40	+2'60	42'15	31'80	+10'35	3'64	Cawnpore		
85	14	6	62	26	30	8	118	16	31	?	?	65	548	36	44	?	?	39'89	33'09	+6'80	3'63	Mainpuri,		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35'17	37'82	-1'30	...	VI.—Upper Sub-Himalayas.
187	3	28	25	42	1	10	21	48	18	35	-49	73	578	32	52	47'17	+4'83	40'27	49'61	-9'34	5'14	Bareilly	N.W. PROVINCES (WEST SUBMONTANE).	24
267	17	5	12	13	14	11	12	14	14	18	-22	69	466	40	84	79'59	+4'41	121'85	88'87	+32'98	9'05	Dehra Dun,		
244	9	3	6	68	5	5	...	25	21	25	-16	70	513	29	49	46'57	+2'43	45'02	43'82	+1'20	7'59	Roorkee,		

Mean of 11 months.
 † Mean of 10 months.

(a) Wind observations of 332 days.

Table

Abstract of observations taken at 8 A.M.

Number of District.	METEOROLOGICAL PROVINCE OR DISTRICT.	STATION.	Elevation of Bar Chamber above sea level in feet.	PRESSURE 8 A.M. IN INCHES.							TEMPERATURE OF AIR.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity 45° Lat.	Highest pressure recorded during year.	Lowest pressure recorded during year.	Absolute range during year.	Mean monthly range of pressure.	Mean of 8 A.M. of year.	Mean maximum of year.	Variation from normal of year.	Mean minimum of year.	Variation from normal of year.	Mean daily temperature of year.	Variation from normal of year.	Mean daily range of temperature.	Highest temperature observed during year.	Lowest temperature observed during year.	Absolute range during year.	Mean monthly absolute range.
22	N.-W. P., WEST	Meerut . . .	738	29.055	-.019	29.778	29.487	28.624	.863	.293	70.3	87.9	+0.2	64.1	+0.6	76.0	+0.2	23.7	109.7	34.5	75.2	39.6
26	SOUTH EAST PUNJAB	Delhi . . .	718	29.074	-.027†	29.772	29.482	28.640	.842	.290	72.4	89.4	+0.2	68.0	+0.9	78.8	+0.6	21.4	112.2	37.9	74.3	38.5
28	CENTRAL PUNJAB	Lahore . . .	702	29.079	-.026	29.771	29.508	28.625	.883	.343	69.9	88.9	+0.2	64.6	?	76.8	?	24.4	114.6	35.2	79.4	41.5
27	SOUTH PUNJAB	Sirsa . . .	662	29.131	-.022*	29.775	29.543	28.692	.851	.309	71.7	93.0	+1.4	64.3	+0.9	78.7	+1.2	26.6	115.3	32.2	83.1	46.5
		Patiala . . .	818	28.969	?	29.774	29.355	28.542	.843	.306	71.2	88.3	?	63.9	?	76.1	?	24.4	111.5	34.0	77.5	41.1
29	PUNJAB (SUBMONTANE).	Ludhiana . . .	812	28.970	-.029	29.773	29.384	28.509	.875	.319	70.2	88.6	0†	65.0	+1.8	76.8	+1.1†	23.6	115.3	35.5	79.8	40.5
		Sialkot . . .	830	28.956	?	29.779	29.371	28.481	.890	.336	70.3	89.1	+1.6	63.4	+1.3	76.2	+1.4	25.7	117.0	35.0	82.0	42.9
		Umballa . . .	892	28.898	?	29.778	29.323	28.457	.866	.308	68.5	88.9	?	62.7	?	75.8	?	26.2	115.4	33.5	81.9	43.3
31	NORTH PUNJAB	Rawalpindi . . .	1,643	28.119	-.022†	29.788	28.518	27.673	.845	.329	66.3	86.2	+2.1	58.9	+1.7	72.5	+1.9	27.3	117.0	31.4	85.6	44.6
	VII.—Indus Valley and North-West Rajputana.			...	-.023	...	...	...	...	...	...	92.7	+1.6	65.6	+0.7	79.2	+1.2	26.9	...	...	80.3	43.3
31	NORTH PUNJAB	Leshawar . . .	1,110	28.702	-.033	29.776	29.134	28.215	.919	.355	67.7	86.3	+0.8	59.6	+0.7	73.0	+0.8	28.8	117.5	29.9	87.6	44.2
32	WEST PUNJAB	Khushab . . .	612	29.179	?	29.779	29.627	28.695	.932	.350	71.2	91.7	?	61.3†	?	77.1†	?	27.9†	116.4	34.0	82.4	45.2†
		Montgomery . . .	558	29.224	-.020*	29.761	29.647	28.767	.880	.346	73.5	93.5	+1.5†	64.5	?	79.0	?	29.0	118.6	34.5	84.1	46.0
		D. I. Khan . . .	594	29.223	-.028	29.780	29.686	28.732	.954	.366	70.2	89.6	?	63.6	+0.1†	76.6	?	26.0	115.2	33.5	81.7	41.7
		Mooltan . . .	420	29.367	?	29.767	29.817	28.907	.910	.353	72.5	94.0	+1.2†	66.6	+0.8*	80.4	?	27.4	117.5	37.5	80.0	43.5
47	SIND	Jacobabad . . .	186	29.598	-.031	29.749	30.043	29.122	.921	.340	73.0	97.8	+2.9	65.7	+1.0	81.8	+2.0	32.1	123.0	33.5	89.5	49.4
		Hyderabad . . .	96	29.727	-.010*	29.778	30.137	29.288	.849	.296	74.8	94.4	+1.5†	68.3	+0.1†	81.4	+0.7*	26.1	114.2	40.5	73.7	42.5
		Kurrachee . . .	30	29.821	-.017	29.802	30.205	29.375	.830	.274	75.6	88.6	+0.4†	70.1	+0.2†	79.4	+0.3†	18.5	105.4	46.0	59.4	32.1
51	WEST RAJPUTANA	Bickancer . . .	771	29.032	?	29.784	29.412	28.624	.788	.292	75.4	94.1	+2.7	69.1	+1.6	81.6	+2.2	25.0	115.8	31.5	84.3	42.7
		Pachpadra . . .	380	29.148	?	29.796	29.822	29.038	.784	.268	71.3	95.8	?	65.0	?	80.1	?	30.8	115.9	33.0	82.9	47.0
		Jodhpur . . .	782	29.036	?	29.793	29.390	28.636	.763	.269	74.4	94.0	?	67.8	?	80.9	?	26.2	114.3	37.1	77.2	42.5
	VIII.—East Rajputana, Central India and Gujarat.			...	-.015	...	...	...	...	...	...	91.9	+1.9	68.1	+1.4	80.0	+1.7	23.7	...	...	68.8	38.4
50	EAST RAJPUTANA	Jeyapore . . .	1,431	28.491	-.016	29.813	28.752	28.029	.723	.260	73.5	92.1	+2.1	66.3	+1.7	79.2	+1.9	25.8	112.5	37.2	75.3	42.9
		Kotah . . .	819	29.051	?	?	29.382	28.662	.720	.274	76.6	93.7	?	70.5	?	82.1	?	23.2	113.6	43.5	70.1	39.4
		Sambhar . . .	1,254	28.564	-.015	29.833	28.928	28.178	.750	.266	72.5	92.2	+3.5	66.0	+1.6	79.1	+2.6	26.2	111.5	35.0	76.5	43.4
		Ajmere . . .	1,611	28.224	-.822	29.828	28.568	27.794	.774	.255	71.1	90.8	+2.3	65.9	+2.4	78.4	+2.4	24.9	110.4	34.0	76.4	41.8
		Oodeypore . . .	1,925	27.903*	?	29.790*	28.726	27.575	.651	.237	76.6	91.2	?	68.1	?	79.7	?	23.1	108.1	39.3	68.8	31.9
		Deesa . . .	466	29.384	-.016	29.813	29.698	29.003	.695	.249	75.6	95.5	+2.4	67.5	+0.9	81.5	+1.7	28.0	114.5	42.0	72.5	43.0
46	KATHIWAR AND GUICH.	Bhuj . . .	395	29.164	?	29.818	29.766	29.038	.758	.250	77.3	92.7	+1.7	69.4	+0.7	81.1	+1.2	23.4	111.3	46.5	64.8	36.3
		Rajkot . . .	429	29.431	-.010*	29.819	29.740	29.015	.725	.236	75.2	93.9	+0.9	67.0	+0.9†	80.5	+1.1†	26.8	109.9	42.0	67.9	41.8
		Veraval . . .	...	29.848	?	29.668	30.131	29.462	.729	.225	76.2	85.7	?	71.4	?	78.5	?	14.3	100.6	51.3	49.3	26.5
		Bhavnagar Para . . .	35	29.829	?	29.810	30.135	29.426	.709	.230	76.7	94.3	?	69.3	?	81.8	?	25.0	112.2	44.2	68.0	40.3
49	CENTRAL INDIA	Nowgong . . .	757	29.068	-.018	29.800	29.479	28.682	.797	.263	72.0	89.2	?	66.1	+1.0	77.7	?	23.1	113.5	37.5	76.0	38.1
		Indore . . .	1,823	28.038	-.003†	29.832	28.337	27.673	.664	.223	72.8	89.1	+1.7	64.5	+1.0	76.8	+1.4	24.6	119.0	39.1	69.9	39.1
		Neemuch . . .	1,630	28.232	?	29.839	28.569	27.359	.710	.296	74.3	90.6	+2.1†	65.1	+0.7†	77.8	+1.6*	25.5	110.6	38.0	72.6	41.0
45	GUJARAT	Surat . . .	39	29.835	?	29.817	30.119	29.440	.679	.212	77.0	92.8	?	70.8	?	81.8	?	22.0	108.6	59.6	58.0*	35.1
		Ahmedabad . . .	164	29.699	?	29.812	30.034	29.323	.711	.234	77.2	94.4	?	71.2	?	82.8	?	23.2	114.3	51.2	63.1	36.7
42	N.-W. P., WEST	Agra . . .	555	29.249	-.028	29.776	29.685	28.831	.854	.290	74.0	91.5	+1.2	68.6	+1.3	80.1	+1.3	22.9	112.0	41.4	70.6	38.8
21	N.-W. P., CENTRAL	Jhansi . . .	858	28.969	-.018	29.795	29.378	28.574	.804	.270	76.4	91.8	+1.1	70.2	+1.9	81.0	+1.4	21.6	114.7	44.4	70.3	37.5
	IX.—Deccan.			...	-.008	...	...	...	...	...	...	91.0	+1.1	67.6	+0.8	79.3	+0.9	23.4	...	...	65.3	36.4
48	BOMBAY DECCAN	Belgaum . . .	2,539	27.366	-.004	29.853	27.570	27.106	.464	.173	71.0	84.7	+0.5	61.0	+0.1	74.4	+0.3	20.7	101.7	49.9	51.8	30.2
		Sholapur . . .	1,590	28.297	-.008†	29.844	28.556	28.005	.551	.192	76.5	93.3	+0.6	68.9	+1.3	81.1	+1.0	24.4	110.2	49.0	61.2	35.2
		Poona . . .	1,840	28.052	-.012	29.858	28.301	27.728	.573	.194	72.3	90.5	+1.7	64.8	-0.2	77.7	+0.8	25.7	109.0	45.9	63.1	37.3
		Bijapur . . .	1,846	27.947	?	29.846	28.180	27.665	.515	.181	74.5	90.9	?	66.6	?	78.8	?	24.2	106.7	45.6	61.1	35.0

* Mean of 10 months.
† Mean of 11 months.

I—contd.

at 215 stations in India, Burma, etc., in the year 1898—contd.

WIND DIRECTION.									WIND VELOCITY.			HYGROMETRY 8 A.M.		Mean cloud amount of year.	RAINFALL.						Heaviest rainfall during year.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.
Number of winds from									Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity of year.	Mean vapour tension of year.		Number of rainy days during year.	Normal number of rainy days during year.	Variation.	Rainfall of year.	Normal rainfall of year.	Variation from normal of year.				
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.																
197	3	8	37	26	...	17	64	13	2'0	2'2	- 9	62	493	2'7	30	39'18	-9'18	25'96	32'89	- 6'93	3'32	Meerut . . .	N.-W. P., West.	22
42	6	9	39	55	12	7	106	89	4'9	3'6	+36	54	470	3'2	36	33'74	+2'26	18'02	30'03	-12'31	2'70	Delhi . . .	SOUTH-EAST PUNJAB.	26
146	30	16	46	55	14	10	29	19	2'3	2'5	- 8	63	491	2'1	28	28'26	-0'26	18'44	21'95	- 3'51	2'09	Lahore . . .	CENTRAL PUNJAB.	28
8	19	25	27	96	22	44	79	45	7'2	3'6	+100	53	452	2'4	16	23'39	-7'39	9'72	15'55	- 5'83	2'75	Sirsa . . .	SOUTH PUNJAB.	27
141	12	100	5	2	17	79	6	1	4'2	?	?	70	576	2'6	31	?	?	20'33	?	?	2'62	Patiala . . .		
188	7	15	4	75	17	9	14	36	2'3	1'5	+53	62	491	3'2	32	37'00	-5'00	24'37	30'90	- 5'93	2'95	Ludhiana . . .	PUNJAB (SUBMONTANE).	29
138	30	69	67	26	4	1	6	14	2'1	1'8	+17	63	495	2'2	35	38'36	-3'36	31'31	34'12	- 2'81	3'64	Sialkot . . .		
223	3	1	46	21	2	...	23	46	1'8	?	?	69	539	2'0	36	?	?	33'27	33'11	+ 0'16	5'78	Umballa . . .		
265	25	10	27	3	3	2	15	14	2'5	2'0	+25	64	446	3'6	50	46'81	+ 3'19	32'90	35'17	- 2'27	3'34	Rawalpindi . . .	NORTH PUNJAB.	31
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7'61	9'66	-2'04	...	VII—Indus Valley and North-West Rajputana.		
205	29	10	4	13	43	25	10	26	2'7	3'4	-21	62	448	2'8	22	21'56	+0'44	13'27	13'54	- 0'27	2'40	Peshawar . . .	NORTH PUNJAB.	31
98	28	104	61	14	18	26	10	6	5'8	?	?	52	439	2'2	20	16'40	+3'60	14'23	10'39	+ 3'84	2'05	Khushab . . .	WEST PUNJAB.	32
70	23	40	43	63	45	56	18	17	6'4	?	?	48	425	1'6	12	15'70	-3'70	5'14	10'88	- 5'74	0'97	Montgomery . . .		
136	40	86	6	31	14	5	13	33	2'7	1'8	+50	63	525	2'3	11	14'73	-3'73	6'84	8'42	-1'58	1'43	D. I. Khan . . .		
155	16	47	2	49	18	63	1	12	1'4	2'5	-44	57	493	1'2	10	11'72	-1'72	3'01	7'56	- 4'55	0'72	Mooltan(a) . . .		
129	19	14	52	80	27	7	8	29	4'0	3'4	+18	56	524	1'7	4	6'63	-2'63	3'25	4'08	- 0'83	0'54	Jacobabad . . .	SIND.	47
52	50	9	1	3	28	163	16	43	?	10'1	?	54	506	3'1	7	10'14	-3'14	3'65	7'06	- 3'41	1'06	Hyderabad . . .		
28	12	55	35	8	4	41	151	28	9'7	13'3	-27	66	637	3'1	6	9'73	-3'73	3'24	7'92	- 4'68	0'80	Kurrachee . . .		
13	20	18	21	22	45	122	64	40	6'9	4'8	+44	55	532	2'5	14	?	?	8'80	11'95	- 3'15	1'53	Bickaneer . . .	WEST RAJPUTANA.	51
6	31	55	24	18	41	93	31	22	9'3	5'8	+60	54	478	2'8	12	?	?	11'95	10'28	+ 1'67	7'55	Pachpadra . . .		
34	16	59	16	8	12	130	34	6	3'9	?	?	47	440	3'0	17	?	?	10'36	14'15	- 3'79	2'81	Jodhpur . . .		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25'73	30'12	-4'20	...	VIII—East Rajputana, Central India and Gujarat.		
53	43	46	26	6	6	36	79	70	4'5	5'1	-16	53	466	3'0	28	38'70	-10'70	20'29	28'76	- 8'47	4'98	Jeypore . . .	EAST RAJPUTANA.	50
99	24	17	21	23	3	46	65	67	4'5	?	?	49	460	2'2	40	?	?	22'57	29'92	- 7'35	3'76	Kotah . . .		
136	35	8	17	12	13	9	119	17	6'1	6'7	- 9	52	453	2'8	20	32'56	-12'56	11'50	22'91	-11'41	2'41	Sambhar . . .		
141	10	17	6	8	12	36	120	15	5'7	4'3	+33	60	491	2'7	19	32'99	-13'99	12'97	22'18	- 9'21	2'10	Ajmere . . .		
100	24	5	7	2	5	36	79	48	5'5	?	?	56	521	2'6	29	?	?	17'54	?	?	1'99	Oodeypore . . .		
...	27	42	76	32	17	56	76	37	9'6	10'3	- 7	55	523	2'9	23	28'81	- 5'81	17'08	26'73	- 9'65	4'69	Deesa . . .		
44	19	19	20	5	6	41	146	65	12'3	10'2	+21	57	566	3'1	16	?	?	13'55	14'61	- 1'06	4'19	Bhuj . . .	KATHIWAR AND CUCH.	46
22	2	18	56	5	13	14	153	25	11'3	9'2	+23	63	584	2'9	25	33'94	- 8'94	16'12	28'67	-12'55	2'48	Rajkot . . .		
15	85	71	7	12	7	36	91	38	7'1	?	?	69	653	3'7	29	?	?	12'84	21'02	- 8'18	2'31	Veraval . . .		
1	17	18	6	8	13	126	77	99	8'7	?	?	56	545	2'9	34	?	?	31'02	?	?	6'00	Bhavnagar . . .		
80	21	11	47	3	17	68	99	19	2'4	2'5	- 4	68	553	3'3	62	49'75	+12'25	62'40	44'43	+17'97	4'08	Nowgong . . .	CENTRAL INDIA	49
109	36	51	4	5	9	38	82	31	3'3	4'2	-21	64	544	3'2	47	48'00	- 1'00	40'24	34'91	+ 5'33	3'76	Indore . . .		
37	24	88	30	9	4	43	99	31	5'3	10'1	-48	56	512	2'3	36	39'18	- 3'18	28'49	32'26	- 3'77	5'24	Neemuch . . .		
82	27	37	37	23	37	53	44	45	4'2	9'0	-53	68	666	3'3	42	49'33	- 7'36	32'54	46'34	-13'80	4'18	Surat . . .	GUJARAT.	45
38	27	66	34	12	19	61	39	67	4'8	?	?	58	565	3'6	30	?	?	34'89	30'32	+ 4'57	3'16	Ahmedabad . . .		
31	...	36	...	73	8	101	...	116	5'7	4'2	+36	60	542	2'5	28	38'91	-10'91	25'67	29'12	- 3'45	2'73	Agra . . .	N.-W. P., West.	22
115	5	13	16	10	3	93	60	50	2'9	2'9	0	55	530	2'3	57	49'07	+ 7'93	37'70	39'63	- 1'93	4'32	Jhansi . . .	N.-W. P., CENTRAL.	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	39'42	41'02	-1'57	...	IX—Deccan		
71	15	25	52	31	6	59	74	32	?	15'7	?	73	557	4'2	100	63'08	+16'92	55'37	48'74	+ 6'63	4'23	Belgaum . . .	BOMBAY, DECCAN.	28
35	11	39	23	63	3	61	49	69	13'7	8'9	+54	50	462	3'7	40	51'01	-11'01	39'86	33'90	+ 0'96	5'22	Sholapur. (b)		
53	6	7	31	28	10	78	103	45	11'1	10'0	+11	63	511	3'9	55	49'36	+ 5'64	26'69	28'74	- 2'05	1'85	Poona . . .		
27	...	9	50	35	3	70	124	47	6'2	?	?	75	649	3'4	44	43'52	+ 0'48	25'18	16'63	+ 8'55	1'93	Bijapur . . .		

(a) Wind observations of 321 days.

(b) " " 338 "

Table

Abstract of observations taken at 8 A. M.

Number of District.	METEOROLOGICAL PROVINCE OR DISTRICT.	STATION.	Elevation of Bar Clinometer above sea level in feet.	PRESSURE 8 A.M. IN INCHES.							TEMPERATURE OF AIR.												
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity 45° Lat.	Highest pressure recorded during year.	Lowest pressure recorded during year.	Absolute range during year.	Mean monthly range of pressure.	Mean of 8 A.M. of year.	Mean maximum of year.	Variation from normal of year.	Mean minimum of year.	Variation from normal of year.	Mean daily temperature of year.	Variation from normal of year.	Mean daily range of temperature.	Highest temperature observed during year.	Lowest temperature observed during year.	Absolute range during year.	Mean monthly absolute range.	
40	KHANDESH	Malegaon	1,430	28.433	?	29.832	28.714	28.095	.619	.201	74.2	92.4	+1.5	65.9	+1.1	79.2	+1.3	26.5	109.8	40.3	69.5	40.9	
		Ahmednagar	2,152	27.743	?	29.848	27.997	27.422	.575	.189	73.9	90.2	?	63.8	?	77.0	?	26.3	105.8	39.9	65.9	40.7	
41	BERAR	Akola	930	28.932	-.004*	29.823	29.275	28.603	.672	.218	76.3	94.2	+2.1	67.8	+1.1	81.0	+1.6	26.4	116.0	42.1	73.9	41.4	
		Amraoti	1,215	28.644	?	29.826	28.968	28.326	.642	.213	76.3	93.1	+1.6	69.8	+1.9†	81.5	+1.7†	23.4	115.0	48.4	66.6	36.9	
42	CENTRAL PROVINCES, WEST.	Khandwa	1,044	28.816	-.003	29.832	29.151	28.463	.688	.221	74.8	93.3	+2.1	67.9	+1.5	80.6	+1.8	25.4	114.7	40.2	74.5	40.8	
		Hoshangabad	1,006	28.841	-.005	29.825	29.192	28.449	.743	.235	73.3	91.3	+1.2	68.0	+1.2*	79.7	+1.2*	23.3	113.5	41.8	71.7	38.2	
		Nagpur	1,025	28.819	?	29.812	29.156	28.500	.656	.222	75.2	92.2	?	68.9	?	80.6	?	23.3	114.2	46.6	67.6	37.4	
43	CENTRAL PROVINCES, CENTRAL.	Chanda	634	29.243	?	29.831	29.567	29.910	.657	.221	75.8	92.8	+0.3	67.6	?	80.2	?	25.3	115.2	42.1	73.1	38.8	
		Seoni	2,033	27.818	-.007	29.811	28.127	27.969	.658	.222	72.9	88.1	+0.8*	64.3	-0.2†	76.2	+0.3†	23.7	110.1	41.0	69.1	37.5	
		Jubbulpore	1,327	28.500	?	29.805	28.871	28.135	.736	.239	72.2	88.9	+0.8*	64.0	-0.3	76.5	+0.2*	24.9	113.0	34.4	78.6	40.3	
		Saugor	1,807	28.036	?	29.809	28.369	27.665	.704	.233	74.9	88.4	+0.7	67.9	?	78.2	?	20.5	110.9	45.1	65.8	35.0	
49	CENTRAL INDIA	Sutna	1,040	28.775	-.016	29.793	29.163	28.406	.757	.252	73.4	88.6	+0.9	66.6	+1.5	77.6	+1.2	22.0	111.6	38.1	73.5	38.1	
44	CENTRAL PROVINCES, EAST.	Raipur	970	28.871	-.004*	29.805	29.215	28.524	.691	.233	75.1	90.9	+0.9	69.4	+0.5	80.2	+0.7	21.5	113.0	46.4	66.6	35.0	
		Sambalpur	486	29.356	-.016	29.799	29.737	28.928	.809	.257	75.3	90.8	0	69.4	-0.2†	80.1	0†	21.4	112.1	43.7	68.4	34.2	
39	HYDERABAD, NORTH.	Aurangabad	1,865	28.031	?	29.848	28.238	27.725	.563	.181	86.6	92.8	?	66.0	?	79.4	?	26.8	113.5	46.2	67.3	39.5	
		Indur	...	...	...	Not recorded.	...	...	...	...	77.3	91.4	?	68.5	?	80.0	?	22.9	115.5	44.1	71.4	36.2
		Bidar	2,165	27.718	?	29.821	27.988	27.425	.563	.193	76.4	88.9	?	66.3	?	77.6	?	22.6	101.3	53.0	48.3	32.1	
53	HYDERABAD, SOUTH.	Gulbarga	1,502	28.409	?	29.873	28.648	28.112	.536	.199	75.6	92.6	?	68.3	?	80.5	?	24.3	109.0	49.0	60.0	36.1	
		Raichur	1,309	28.571	?	29.835	28.828	28.276	.552	.196	77.4	92.1	?	71.7	?	81.9	?	20.4	110.0	52.2	57.8	31.5	
		Hyderabad (Dn.)	1,690	28.193	?	29.839	28.459	27.862	.597	.211	74.8	90.8	+0.7	69.1	+1.0*	80.0	+0.7*	21.7	108.9	49.3	59.6	32.0	
		Secunderabad	1,787	28.093	?	29.840	28.351	27.769	.582	.204	73.9	91.6	+1.5	69.1	+1.1	80.4	+1.4	22.5	110.3	51.2	59.1	34.5	
		Hanamcanda*	...	28.969	?	?	29.246	28.634	.612	.232	78.4	91.6	?	72.2	?	81.9	?	19.4	110.7	57.2	53.5	31.7	
X.—West Coast.				...	...	-.016	...	...	...	...	...	86.6	+0.8	74.7	+0.7	80.7	+0.8	12.0	...	...	30.5	19.7
37	KONKAN	Bombay	37	29.856	-.015	29.833	30.106	29.498	.608	.200	78.7	86.7	+1.2	75.7	+1.1	81.2	+1.2	10.9	95.0	62.5	32.5	19.3	
		Ratnagiri	110	29.780	-.007	29.829	30.009	29.475	.534	.188	79.2	88.1	+1.0	74.3	+1.5	81.1	+1.3	13.9	97.9	60.9	37.0	23.3	
		Mormugao	60	29.852	?	29.848	30.050	29.599	.451	.172	78.3	86.3	?	75.0	?	80.7	?	11.3	93.0	64.4	28.6	18.8	
		Goa	199	29.702	-.005†	29.839	29.897	29.442	.455	.173	78.6	85.1	?	74.9	?	80.0	?	10.2	90.5	63.5	27.0	17.6	
		Karwar	44	29.857	-.019	29.833	30.043	29.600	.443	.172	76.0	86.7	+0.7	72.9	+0.4	79.8	+0.6	13.8	97.3	58.5	34.8	21.0	
13	MALABAR	Cochin	10	29.908	-.024	29.846	30.036	29.761	.296	.143	78.9	88.5	+1.2	75.2	+0.6	81.9	+0.9	13.3	96.5	66.3	30.2	20.5	
		Calicut	27	29.888	-.024	29.845	30.056	29.749	.307	.154	78.4	87.1	+0.3	74.3	+0.4	80.7	+0.4	12.9	93.9	64.5	29.4	20.2	
		Mangalore	65	29.853	-.019	29.851	30.030	29.686	.344	.161	78.5	87.1	+0.5	74.3	+0.4	80.7	+0.5	12.8	94.8	65.5	29.3	20.8	
		Trivandrum	198	29.709	?	29.840	29.851	29.569	.282	.147	78.0	84.1	?	75.6	?	79.9	?	8.5	90.0	63.0	27.0	15.8	
XI.—South India.				...	...	-.016	...	...	...	...	...	90.3	+0.6	72.1	+0.3	81.2	+0.5	18.1	...	...	47.5	28.6
37	MADRAS, SOUTH	Pamban	37	29.865	?	29.829	30.073	29.683	.390	.165	82.5	88.0	?	77.0	?	82.5	?	11.0	94.3	70.0	24.3	16.5	
		Tinnevely	163	29.739	?	29.837	29.964	29.517	.447	.176	81.5	94.2	?	76.4	?	85.3	?	17.8	106.6	62.9	43.7	28.7	
		Madura	447	29.418	-.018	29.833	29.678	29.203	.475	.179	80.4	93.3	?	74.1	?	83.7	?	19.2	105.5	63.7	41.8	29.0	
34	MADRAS, SOUTH CENTRAL.	Salem	940	29.987	-.019	29.874	29.218	28.739	.479	.179	78.0	93.2	+0.6	71.7	+1.0	82.2	+0.8	22.0	104.9	56.5	48.4	31.9	
		Coimbatore	1,348	28.558	-.017	29.860	28.760	19.337	.423	.171	75.7	90.4	+0.2	70.0	+0.4	80.2	+0.3	20.4	101.9	58.7	43.2	29.6	
35	COORG	Mercara	3,781	26.215	-.016	?	26.375	26.006	.369	.155	66.0	76.2	-0.1	62.2	+1.1	69.2	+0.5	14.0	91.0	51.7	39.3	22.6	
36	MYSORE	Chitaldroog	2,405	27.510	?	29.845	27.706	27.243	.463	.178	73.4	86.6	?	67.2	?	76.9	?	19.3	101.2	54.9	46.3	28.6	
		Bangalore	3,021	26.929	-.020	29.861	27.135	26.682	.453	.169	70.1	84.7	+0.9	64.5	+0.6	74.6	+0.8	20.2	97.8	51.9	45.9	29.0	
		Hassan	3,091	26.868	?	29.873	27.040	26.643	.397	.157	71.1	82.7	?	62.2	?	72.5	?	20.5	97.4	46.9	50.5	30.3	
		Mysore	2,518	27.426	?	29.872	27.604	27.200	.404	.163	72.5	86.3	?	65.6	?	76.0	?	20.7	98.7	53.9	44.8	30.0	

* Mean of 11 months.

† Mean of 10 months.

I—contd.

at 215 stations in India, Burma, etc., in the year 1898—contd.

WIND DIRECTION.									WIND VELOCITY.			HYGROMETRY S.A.M.		Mean cloud amount of year.	RAINFALL.						Heaviest rainfall during year.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.	
Calm.	Number of winds from								Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity of year.	Mean vapour tension of year.		Number of rainy days during year.	Normal number of rainy days during year.	Variation.	Rainfall of year.	Normal rainfall of year.	Variation from normal of year.					
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.																	
45	12	12	3	3	2	64	157	67	14.0	7.2	+95	60	.530	3.6	27	40.57	-13.57	15.61	25.60	-9.99	2.51	Malegaon.	KHANDISH.	40	
49	60	27	17	24	14	43	61	70	11.3	?	?	61	.513	3.7	33	?	?	15.64	25.55	-9.91	1.79	Ahmednagar.	BERAR.	31	
62	2	22	38	39	8	29	100	65	6.0	5.5	+9	53	.492	3.5	48	50.58	-2.58	20.79	37.90	-17.11	2.14	Akola.			
1	16	45	81	21	21	50	96	34	7.8	4.7	+66	59	.544	3.5	46	50.99	-4.99	21.45	37.41	-15.96	1.23	Amraoti.			
96	8	23	21	13	7	17	121	59	6.3	5.4	+17	54	.479	2.8	35	44.36	-9.36	26.30	33.29	-6.99	4.21	Khandwa.	CENTRAL PROVINCES, WEST.	42	
143	3	71	23	...	9	71	42	3	2.6	3.0	-13	63	.523	3.3	54	60.53	-6.53	59.73	56.58	+3.15	9.40	Hoshangabad.	CENTRAL PROVINCES, CENTRAL.	43	
179	27	16	8	6	11	31	50	37	6.0	6.4	-6	59	.521	3.9	58	64.93	-6.93	53.44	50.91	+2.53	8.63	Nagpur.			
93	39	32	34	20	18	24	82	23	3.3	3.7	-11	65	.590	3.4	58	?	?	61.68	58.53	+3.15	5.35	Chanda.			
...	48	85	18	21	12	74	35	72	2.8	3.9	-28	61	.491	3.0	76	73.65	+2.35	58.33	58.89	-0.56	7.20	Seoni.	CENTRAL INDIA.	49	
27	18	23	9	90	58	52	67	21	3.1	3.3	-6	66	.526	3.3	75	65.62	+9.38	69.72	60.37	+9.35	4.25	Jubbulpore.			
5	19	33	40	51	44	44	116	12	5.0*	3.5	+43	56	.500	3.1	69	56.93	+12.07	62.82	48.93	+13.89	3.31	Saugor.			
30	56	27	12	19	24	18	89	90	6.6	6.1	+8	60	.528	2.6	67	52.91	+14.09	58.37	46.48	+11.89	3.83	Sutna.	CENTRAL PROVINCES, EAST.	44	
156	7	27	11	10	15	110	19	10	6.6	5.6	+18	62	.542	3.6	52	65.61	-13.61	42.68	52.52	-9.84	3.20	Raipur.	HYDERABAD, NORTH.	39	
...	56	105	20	61	15	76	16	12	4.2	2.3	+83	72	.643	3.3	63	?	?	54.55	68.05	-13.50	5.80	Sambalpur.			
137	4	50	16	6	1	78	54	16	4.5	?	?	52	.472	3.3	46	?	?	23.16	32.27	-9.11	3.25	Aurangabad.			
129	25	5	17	18	13	27	87	44	6.2	?	?	68	.650	3.7	58	?	?	44.44	37.40	+7.04	6.20	Indur.	HYDERABAD, SOUTH.	53	
...	29	35	47	31	21	90	84	28	7.9	?	?	70	.635	2.4	68	?	?	35.72	42.04	-6.32	2.80	Bidar.			
133	15	41	20	13	5	27	41	69	11.0	?	?	60	.537	2.9	63	?	?	35.52	29.19	+6.33	4.70	Gulbarga.			
...	30	22	70	32	20	57	106	28	8.6	?	?	65	.615	3.0	51	?	?	27.28	28.22	-0.94	4.77	Raichur.	KONKAN.	37	
160	3	3	21	26	6	...	134	12	5.4	?	?	68	.592	3.5	52	?	?	27.34	33.72	-6.38	2.88	Hyderabad (Du).			
62	6	22	77	26	3	24	90	55	6.7	6.5	+3	65	.544	3.4	47	?	?	29.57	33.72	-4.15	3.80	Secunderabad.			
74	21	1	3	68	57	11	68	31	8.8	?	?	69	.672	3.6	55	?	?	38.76	?	?	8.00	Hanamcanda.	MALABAR.	33	
...	105.30	103.13	+2.17	...	X.—West Coast.			
4	40	77	65	29	29	30	71	20	10.7	12.2	-12	78	.792	4.0	78	76.63	+1.37	74.09	74.12	-0.03	6.46	Bombay.			
83	25	15	44	58	16	26	64	34	5.8	10.2	-43	72	.725	4.0	97	97.80	-0.80	100.39	111.65	-11.26	8.33	Ratnagiri.	MADRAS (SOUTH).	57	
18	48	13	43	106	16	16	14	88	8.9	?	?	83	.816	4.2	110	?	?	107.20	91.80	+15.40	5.47	Mormugao.			
20	38	66	106	11	11	39	51	23	?	?	?	79	.783	5.1	112	?	?	115.53	103.32	+12.21	5.20	Goa.			
38	70	64	73	6	4	39	35	36	4.3	?	?	82	.739	3.9	119	109.07	+9.93	138.55	129.19	+9.36	6.20	Karwar.	MADRAS (CENTRAL).	24	
54	121	101	21	9	4	7	15	33	5.6	?	?	81	.802	5.2	128	132.16	-4.16	125.76	116.52	+9.24	6.46	Cochin.			
85	28	37	81	52	8	6	10	58	9.0	?	?	83	.802	5.5	128	113.90	+14.10	112.08	113.13	-1.05	5.05	Calicut.			
120	17	22	89	59	12	9	15	22	2.6	3.4	-24	79	.779	5.7	130	118.30	+11.70	121.22	122.74	-1.52	3.94	Mangalore.	COORG.	35	
110	110	25	17	4	...	3	20	76	5.2	?	?	81	.780	5.9	90	?	?	52.87	65.69	-12.82	2.25	Trivandrum.			
...	42.12	36.61	+5.51	...	XI.—South India.			
15	26	69	27	28	25	99	33	43	11.6	?	?	80	.887	3.0	60	33.10	+26.90	50.91	37.00	+13.91	4.75	Pamban.	MYSORE.	26	
...	74	38	3	10	6	30	72	132	5.9	?	?	69	.745	4.3	52	43.00	+9.00	29.53	28.53	+1.00	2.17	Tinnevely.			
19	116	55	11	13	7	16	11	117	4.5	4.2	+7	71	.746	3.9	65	43.71	+21.29	47.18	32.69	+14.49	5.17	Madura.			
79	6	60	43	4	20	93	36	24	6.0	4.4	+36	77	.735	4.2	62	66.50	-4.50	47.24	41.44	+5.80	3.00	Salem.	MYSORE.	36	
2	1	22	156	19	36	79	49	1	2.4	4.8	-50	82	.734	5.6	49	45.20	+3.80	23.96	21.24	+2.72	2.10	Coimbatore.			
130	8	43	45	6	3	5	79	46	5.9	5.8	+2	84	.543	5.9	132	137.20	-5.20	109.35	129.37	-20.02	3.45	Mercara.			
7	6	10	61	45	4	83	112	27	9.2	?	?	70	.582	5.6	49	?	?	30.54	25.43	+5.11	2.05	Chitaldroog.**	MYSORE.	26	
3	3	52	99	22	18	81	73	14	8.0	5.2	+54	78	.584	5.1	54	61.68	-7.68	31.53	35.86	-4.33	2.59	Bangalore.			
8	7	54	64	39	8	42	93	50	3.6	?	?	75	.569	6.0	85	?	?	39.86	30.47	+9.39	3.12	Hassan.			
3	10	59	51	14	15	100	100	13	10.1	?	?	75	.603	5.8	55	?	?	29.21	29.04	+0.17	2.32	Mysore.			

* Wind observation of 334 days.

** Wind observation of 355 days.

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Table

Abstract of observations taken at 8 A. M.

Number of District.	METEOROLOGICAL PROVINCE OR DISTRICT.	STATION.	Elevation of Bar Clinometer above sea level in feet.	PRESSURE 8 A.M. IN INCHES.							TEMPERATURE OF AIR.											
				Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity at 45° Lat.	Highest pressure recorded during year.	Lowest pressure recorded during year.	Absolute range during year.	Mean monthly range of pressure.	Mean of 8 A.M. of year.	Mean maximum of year.	Variation from normal of year.	Mean minimum of year.	Variation from normal of year.	Mean daily temperature of year.	Variation from normal of year.	Mean daily range of temperature.	Highest temperature observed during year.	Lowest temperature observed during year.	Absolute range during year.	Mean monthly absolute range.
56	MADRAS, EAST-COAST, SOUTH.	Negapatam . . .	31	29'864	-.019	29'824	30'083	29'625	'458	'181	81'5	90'8	?	76'3	+0'7	83'6	?	14'5	108'5	66'0	42'5	26'0
		Cuddalore . . .	12	29'882	?	29'823	30'136	29'593	'543	'197	80'2	90'6	?	72'9	?	81'8	?	17'8	109'4	59'3	50'1	29'2
		Trichinopoly . . .	255	29'644	-.023	29'833	29'863	29'403	'460	'181	79'9	91'9	+0'9*	74'5	+0'8	84'8	+0'8*	20'4	108'2	60'4	47'8	30'2
		Madras . . .	22	29'875	-.017	29'827	30'135	29'574	'561	'213	80'8	91'0	+0'2	74'3	-0'3	82'7	-0'1	16'6	110'0	60'0	50'0	28'5
55	MADRAS, EAST-COAST, CENTRAL.	Nellore . . .	71	29'809	?	29'814	30'085	29'493	'592	'230	81'1	93'9	?	74'9	?	84'4	?	19'0	114'8	60'1	54'7	32'7
		Masulipatam . . .	15	29'867	-.004	29'816	30'160	29'410	'750	'260	80'0	90'6	+0'2	74'3	0	82'4	+0'1	16'3	115'7	58'2	57'5	28'0
54	MADRAS, CENTRAL.	Cuddapah . . .	433	29'456	-.018	29'830	29'708	29'162	'546	'202	80'8	95'9	+1'5	74'4	+0'4*	85'2	+1'0*	21'4	109'8	60'4	49'4	33'9
		Kurnool . . .	923	28'956	-.018	29'831	29'217	28'658	'559	'205	76'7	94'1	+0'9	70'3	-0'2	82'2	+0'4	23'8	111'8	51'2	60'6	35'7
		Bellary . . .	1,475	28'417	-.010	29'844	28'655	28'127	'528	'186	77'2	93'0	0	70'8	+0'4	81'9	+0'2	22'2	108'2	53'6	54'6	32'5
52	MADRAS, EAST-COAST, NORTH.	Cocanada . . .	26	29'847	?	29'808	30'156	29'422	'734	'251	79'3	89'3	?	74'9	+0'1	82'1	?	14'5	111'1	58'5	52'6	26'4
		Vizagapatam . . .	31	29'832	-.006	29'800	30'156	29'379	'777	'271	89'8	88'7	?	73'8	?	81'3	?	14'9	103'7	55'4	48'3	26'0
		Waltair* . . .	...	...	...	...	Not recorded.	...	...	...	80'1	87'2	?	75'3	?	81'3	?	11'9	100'7	61'9	38'8	22'4
		Gopalpur . . .	21	29'823	?	29'781	30'169	29'354	'815	'279	77'3	86'4	?	72'0	?	79'2	?	14'4	100'8	52'1	48'7	25'1
XII.—Hill Stations.																						
48	BALUCHISTAN . . .	Shahrig . . .	...	25'764	?	?	26'060	25'400	'660	'263	68'2	84'0	?	54'7	?	69'3	?	29'3	110'0	23'0	87'0	47'9
		Pishin . . .	...	...	...	...	Not recorded.	...	...	...	?	78'2	?	39'3*	?	59'8*	?	40'9	103'9	8'9	95'0	61'6*
		Quetta . . .	5,502	24'622	+0'06	?	24'909	24'344	'555	'246	55'6	75'4	+2'1	43'5	-1'1	59'5	+0'6	31'9	98'6	15'8	82'8	51'4
		Kalat . . .	...	...	...	...	Not recorded.	...	...	...	58'6	75'3	?	36'6	?	56'0	?	38'7	100'9	7'0	93'9	61'1
		Chaman . . .	4,311	25'670	?	?	25'956	25'297	'659	'260	64'7	80'1	?	54'3	?	67'2	?	25'7	107'7	13'1	94'6	47'5
20	PUNJAB . . .	Leh . . .	11,503	19'703	+0'05	?	19'956	19'149	'807	'338	38'2	57'4	+0'5	31'1	+1'0	44'3	+0'9	26'3	88'7	-1'5	90'2	45'5
		Srinagar . . .	5,204	24'872	?	?	25'252	24'492	'760	'358	50'4	68'6	?	43'9	?	56'3	?	24'7	96'9	17'8	79'1	42'6
		Skardu . . .	...	?	?	?	?	?	?	?	48'7	64'3	?	42'7	?	53'5	?	21'6	97'1	2'2	94'9	43'8
		Dras . . .	...	20'770	?	?	21'031	20'243	'838	'373	36'0	54'8	?	22'9	?	38'9	?	31'9	90'5	-28'0	118'5	58'6
		Gilgit . . .	4,890	25'129	?	?	25'593	24'430	1'163	'509	59'3	70'3	?	53'6	?	61'9	?	16'7	101'8	23'5	78'3	34'7
		Chitral . . .	...	24'740	?	?	25'100	24'300	'800	'384	52'6	74'0	?	45'8	?	60'0	?	28'2	104'2	25'0	79'2	45'0
		Killa Drosh . . .	...	...	...	...	Not recorded.	...	...	...	58'8	74'7	?	52'9	?	63'8	?	24'7	104'0	24'2	79'8	40'8
		Para Chinari . . .	6,000	24'426	?	?	24'666	24'104	'562	'305	58'5	71'5	?	48'7	?	60'1	?	22'7	99'9	16'1	83'8	41'8
		Cherat . . .	...	25'660	?	?	25'946	25'330	'616	'282	62'8	74'3	?	57'3	?	65'8	?	17'0	106'0	25'5	80'5	38'7
		Murree . . .	6,333	23'805	-.013	?	24'030	23'487	'543	'274	57'1	65'7	-0'1	52'7	+1'9	59'2	+0'9	13'0	93'4	20'0	73'4	34'0
		Poo . . .	...	...	...	...	Not recorded.	...	...	...	?	65'2	?	43'2	?	54'2	?	22'0	88'6	19'5	69'1	38'0
		Simla . . .	7,224	23'087	-.006	?	23'284	22'739	'545	'259	54'3	61'8	+0'3	50'5	+0'6	56'2	+0'4	11'2	81'5	23'0	58'5	28'0
25	NORTH-WESTERN PROVINCES.	Chakrata . . .	7,022	23'260	+0'06	?	23'470	22'917	'553	'258	54'8	64'4	+0'2	50'0	+0'5	57'2	+0'3	14'5	81'3	25'1	56'2	30'6
		Mussooree . . .	6,705	23'513	?	?	23'719	23'171	'548	'262	56'1	63'6	?	51'8	?	57'7	?	11'8	83'8	27'5	56'3	27'6
		Ranikhet . . .	6,039	24'077	+0'04	?	24'303	23'811	'492	'272	58'5	68'3	+0'7	54'1	+1'0	61'2	+0'9	14'3	88'1	32'0	56'1	29'9
		Muktesar . . .	...	22'826	?	?	23'032	22'442	'590	'256	54'3	64'4	?	49'2	?	56'8	?	15'2	84'1	28'1	56'0	31'2
		Yatung . . .	10,480?	...	...	...	Not recorded.	...	...	...	?	54'2	?	39'9	?	47'0	?	14'3	70'0	17'9	52'1	29'2
13	BENGAL . . .	Darjeeling . . .	7,409	22'962	-.008	?	23'214	22'625	'589	'250	51'8	59'6	+0'3	?	?	?	?	75'7	?	?	?	?
		Gantok . . .	5,660	24'475	?	?	24'678	24'206	'472	'222	57'1	67'4	?	41'0	?	54'2	?	26'4	81'8	23'0	58'8	39'1
		Mount Abu . . .	3,945	26'010	-.020	?	26'270	25'702	'568	'212	68'2	76'4	+0'2	6'32	+1'4	69'8	+0'8	13'2	83'7	41'6	52'1	26'5
CENTRAL INDIA . . .	Pachmarhi . . .	3,528	26'412	-.014	?	26'656	26'078	'578	'204	69'4	80'4	+1'3	61'2	+0'3	70'8	+0'8	19'2	101'7	35'3	66'4	33'6	
	Wellington . . .	6,200	24'230	-.029	?	24'357	24'041	'316	'145	62'3	72'0	+1'3	53'2	-0'6	62'6	+0'4	18'8	82'2	33'2	49'0	30'3	

* Mean of 11 months.

§ Mean of 10 months.

I—contd.

at 215 stations in India, Burma, etc., in the year 1898—contd.

WIND DIRECTION.									WIND VELOCITY.			HYGROMETRY S.A.M.		Mean cloud amount of year.	RAINFALL.						Heaviest rainfall during year.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.	Number of District.	
Number of winds from									Mean velocity in miles per hour.	Normal.	Percentage variation.	Mean humidity of year.	Mean vapour tension of year.		Number of rainy days during year.	Normal number of rainy days during year.	Variation.	Total of year.	Normal rainfall of year.	Variation from normal of year.					
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.																	
21	10	62	9	15	14	116	54	64	10.7	5.6	+91	76	.816	5.1	64	60.74	+3.26	72.69	54.66	+18.03	8.76	Negapatam .	MADRAS, EAST-COAST, SOUTH.	56	
1	65	10	9	18	45	62	90	65	1.6	?	?	81	.805	3.5	71	56.80	+14.20	70.94	47.22	+31.72	8.94	Cuddalore.			
126	35	26	2	5	9	41	101	20	5.7	5.8	-2	72	.729	4.8	53	45.45	+7.55	34.71	32.69	+2.02	3.27	Trichinopoly.			
10	56	35	13	11	61	65	65	49	6.3	7.1	-11	76	.799	5.2	72	60.53	+11.47	68.14	49.02	+19.12	4.10	Madras.	MADRAS, EAST-COAST, CENTRAL.	55	
141	2	2	2	27	32	3	73	83	6.6	?	?	75	.791	5.3	40	44.30	-4.30	36.65	35.63	+1.02	4.23	Nellore .			
39	87	39	3	30	31	23	52	61	7.8	7.0	+11	81	.836	4.6	51	55.24	-4.24	47.86	43.54	+4.32	4.65	Masulipatam.			
...	8	75	49	60	4	71	46	52	?	?	?	69	.725	4.0	44	46.00	-2.00	28.81	34.18	-5.37	4.59	Cuddapah .	MADRAS, CENTRAL.	54	
189	2	1	11	4	9	17	118	14	?	?	?	65	.602	4.0	51	48.93	+2.07	31.56	30.06	+1.50	2.88	Kurnool.			
106	7	4	23	36	19	13	111	46	6.7	6.5	+3	55	.516	5.2	36	35.00	+1.00	17.84	19.73	-1.89	1.46	Bellary.			
8	90	33	4	9	10	77	86	48	8.2	?	?	73	.743	3.6	50	55.10	-5.10	52.56	44.54	+8.02	4.22	Cocanada.	MADRAS, EAST-COAST, NORTH.	52	
178	13	25	...	3	4	91	47	4	?	2.9	?	76	.783	4.7	44	64.36	-20.36	52.52	46.47	+6.05	5.87	Visagapatam.			
...	28	22	15	14	21	111	109	11	?	?	?	75	.781	4.7	?	?	?	?	?	?	?	Walairi .			
18	98	6	4	3	26	116	8	86	12.8	9.6	+33	81	.777	1.6	51	61.35	+10.35	32.29	49.41	-17.12	4.15	Gopalpur.			
...	XII.—Hill Stations.			
77	157	5	8	36	9	11	15	42	5.6	?	?	37	.285	1.4	17	?	?	8.76	14.60	-5.84	1.07	Shahrig.	BALUCHISTAN.	48	
				Not recorded.					?	?	?	?	?	?	?	?	?	?	?	?	?				
329	2	3	...	12	9	4	5	1	2.5	4.1	-39	61	.296	1.9	13	22.45	-9.45	6.57	10.89	-4.32	1.19	Pishin.			
2	33	1	80	7	129	18	70	22	...	?	?	45*	.244*	1.3†	11	?	?	4.57	9.05	-4.48	0.77	Kalat.	PUNJAB.	30	
2	9	13	84	98	46	77	20	16	9.6	?	?	41	.264	1.1	11	?	?	3.11	7.43	-4.32	0.69	Chaman.			
...	...	3	5	2	23	50	250	32	2.8	?	?	48	.127	4.7	8	?	?	2.59	3.17	-0.58	0.25	Leh .			
109	18	23	29	79	50	11	18	28	5.8	?	?	85	.361	4.2	45	?	?	18.49	35.24	-16.75	1.52	Srinagar	NORTH-WESTERN PROVINCES.	25	
196	7	44	4	1	8	20	78	7	5.9	?	?	79	.285	4.2	12	?	?	9.83	13.32	-3.49	5.08	Skardo.			
330	7	4	5	...	1	7	5	6	3.8	?	?	78	.225	4.0	57	?	?	21.45	24.25	-2.80	1.46	Dras.			
273	2	3	9	5	2	20	47	4	2.3	?	?	48	.260	5.0	16	?	?	5.41	4.08	+1.33	0.58	Gilgit.	BENGAL.	12	
245	27	9	7	2	12	12	36	15	4.7	?	?	67	.302	2.1	44	?	?	26.89	?	?	3.40	Chitral.			
96	24	15	56	20	9	25	89	5	?	?	?	47	.251	3.6	40	?	?	25.41	?	?	3.25	Killa Droesh.			
...	65	58	41	38	25	46	48	44	5.3	?	?	51	.261	2.5	58	?	?	27.55	?	?	2.20	Para Chinari.	CENTRAL INDIA.		
23	142	38	4	19	69	10	6	54	13.4	?	?	51	.319	3.0	34	?	?	21.86	26.16	-4.30	2.97	Cherat.			
211	25	6	6	72	33	1	1	10	6.7	6.8	-1	53	.266	2.6	79	67.56	+11.44	57.53	56.29	+1.24	3.70	Murree			
61	13	10	46	37	21	35	79	42	?	?	?	?	?	3.7	20	?	?	4.89	18.56	-13.67	0.92	Poo.**	SOUTH INDIA.		
102	87	68	18	23	47	14	1	3	4.3	2.2	+95	56	.256	4.0	88	84.52	+3.48	52.36	64.19	-11.83	2.40	Simla.			
180	106	9	...	7	48	2	...	13	9.9	5.1	+94	61	.280	3.9	86	?	?	74.13	67.76	+6.37	3.68	Chakrata .			
33	21	101	25	13	6	46	120	...	?	?	?	64	.308	3.8	99	79.73	+19.27	119.08	97.95	+21.13	6.30	Mussooree.	BENGAL.		
167†	14	23	22	18	20	30	37	34	3.1	2.1	+48	65	.336	3.8	83	77.29	+5.71	54.89	54.44	+0.45	3.05	Ranikhet.			
...	6	18	33	89	18	24	20	157	1.1	?	?	60	.270	4.4	89	?	?	56.18	?	?	3.86	Muktesar.			
				Not recorded.					?	?	?	?	?	?	107	?	?	45.24	49.45	-4.21	2.68	Yatung .	CENTRAL INDIA.		
69	12	60	91	61	10	24	28	10	4.3	4.1	+5	89	.407	5.9	118	125.43	-7.43	131.20	121.69	+9.51	7.04	Darjeeling.			
304	3	15	2	4	6	13	5	6	2.5	?	?	86	.418	?	176	?	?	142.63	143.89	-1.26	3.48	Gantok.††			
53	30	46	3	2	12	121	60	38	8.9	7.0	+27	52	.351	3.1	50	53.19	-3.19	33.73	66.87	-33.14	3.53	Mount Abu .	SOUTH INDIA.		
10	5	11	6	7	9	35	56	26	8.5	5.2	+63	65	.461	3.4	79	80.37	-1.37	71.37	78.23	-6.86	6.93	Pachmarhi.			
02	33	38	9	21	10	42	6	4	3.1	3.3	-6	68	.242	4.7	101	88.63	+12.37	51.64	52.96	-1.32	2.17	Wellington .			

† Wind observations of 331 days.
‡ " " " 339 "

** Wind observations of 344 days.

†† Wind observations of 358 days. S 2

Table

Abstract of observations taken at 8 A.M.

METEOROLOGICAL PROVINCE OR DISTRICT.	STATION.	Elevation of Bar Cistern above sea level in feet.	PRESSURE 8 A.M. IN INCHES.							TEMPERATURE OF AIR.											
			Mean actual pressure (reduced to 32°).	Variation from normal.	Mean pressure reduced to sea level and to constant gravity 45° Lat.	Highest pressure recorded during year.	Lowest pressure recorded during year.	Absolute range during year.	Mean monthly range of pressure.	Mean of 8 A.M. of year.	Mean maximum of year.	Variation from normal of year.	Mean minimum of year.	Variation from normal of year.	Mean daily temperature of year.	Variation from normal of year.	Mean daily range of temperature.	Highest temperature observed during year.	Lowest temperature observed during year.	Absolute range during year.	Mean monthly absolute range.
XIII.—Extra India.																					
CEYLON . . .	Trincomalee . .	12	29.870	?	29.808	30.058	29.664	.394	.162	80.6	88.7	?	76.4	?	82.6	?	12.3	96.5	70.0	26.5	19.2
	Colombo . . .	40	29.880	—028	29.847	30.058	29.745	.313	.152	80.0	87.7	?	75.5	?	81.6	?	12.2	94.5	67.5	27.0	19.5
PERSIA . . .	Meshed . . .	3,104			Not recorded.					53.7	?	?	44.8	?	?	?	?	0	?	?	
	Teheran . . .	...	26.006	?	?	26.520	25.640	.880	.475	58.2	71.5	?	49.8	?	60.7	?	21.7	104.7	10.0	94.7	42.5
	Ispahan . . .	...	?	?	?	?	?	?	?	55.9	72.8	?	43.7	?	58.3	?	29.1	102.8	-4.2	107.0	48.3
	Bushire . . .	14	29.864	+005	29.836	30.419	29.382	1.037	.309	73.7	80.7	-1.8	67.9	-0.3	74.3	-1.1	12.8	107.0	39.4	67.6	32.7
	Jask . . .	...	29.890	?	?	30.344	29.408	.936	.298	77.7	85.5	?	72.5	?	79.0	?	13.1	100.8	47.3	53.5	26.7
	Muscat . . .	20	29.851	?	29.819	30.287	29.368	.919	.284	80.2	82.8	?	78.1	?	80.5	?	4.7	100.5	62.1	38.4	15.3
ARABIA . . .	Baghdad . . .	220	29.785	?	29.986	30.432	29.214	1.218	.463	66.2	85.5	-0.3	59.2	+0.3	72.4	-0.1	26.3	118.7	26.7	92.0	44.9
	Aden . . .	94	29.805	—026	29.831	30.087	29.472	.615	.181	80.9	87.9	-0.9	77.9	+0.5	82.9	-0.2	10.1	99.3	67.4	31.9	18.5
	Perim . . .	...	29.679	?	?	29.944	29.374	.570	.189	82.5	89.6	?	79.6	?	84.6	?	10.1	106.8	70.6	36.2	17.8
	Kabul . . .	...			Not recorded.					50.6	75.3	?	42.4	?	58.9	?	33.0	99.1	0.4	98.7	55.6
CENTRAL ASIA . .	Kashgar . . .	...	25.612	?	?	26.330	25.150	1.180	.563	50.9	66.7	?	43.8	?	55.3	?	22.8	102.1	8.7	93.4	46.5
ARABIAN ISLANDS.	SEA Amini Devi . .	15	29.921	?	?	30.105	29.724	.381	.156	?	83.7	?	77.0	?	80.4	?	6.8	91.6	67.8	23.8	16.2
	Minicoy† . . .	10	29.876	?	29.811	30.037	29.724	.295	.135	82.3	86.9	?	?	?	?	?	?	92.6	?	?	?
AFRICA . . .	Zanzibar . . .	73	29.977	?	29.977	30.136	29.837	.299	.128	79.2	84.7	?	77.2	?	81.0	?	7.6	91.0	70.0	21.0	13.0

† Mean of 10 months.

Note.—When a query is inserted against any reading or in the variation returns for any station

I—concl'd.

at 215 stations in India, Burma, etc., in the year 1898—concl'd.

WIND DIRECTION.									WIND VELOCITY.			HYGROMETRY 8 A.M.		Mean cloud amount of year.	RAINFALL.					Heaviest rainfall during year.	STATION.	METEOROLOGICAL PROVINCE OR DISTRICT.		
Number of winds from									Mean velocity in miles per hour.	Normal.	Percentage variations.	Mean humidity of year.	Mean vapour tension of year.		Number of rainy days during year.	Normal number of rainy days during year.	Variation.	Rainfall of year.	Normal rainfall of year.				Variation from normal of year.	
Calm.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.																
...
44	23	37	...	5	5	237	1	13	6'6"	?	?	82	'856	2'6	81	...	...	80'20	75'24	+ 4'96	6'48	Trincomalee	CEYLON.
16	29	54	31	48	24	91	64	8	7'9	7'6	+ 4	83	'858	5'3	126	...	...	107'10	90'04	+17'06	5'07	Colombo.	
				Not recorded.								63	'278	2'8	19	...	...	6'51	8'12	-1'61	0'90	Meshed	PERSIA
239	32	47	5	...	13	10	11	6	2'7	?	?	...	...	2'7	17	...	...	7'32	9'76	-2'44	1'15	Teheran ‡	
141	13	19	4	21	9	53	73	32	3'6	?	?	60	'304	1'6	8	...	...	2'73	4'69	-1'96	0'90	Ispahan.	
30	86	75	52	37	9	5	7	60	8'2	7'9	+4	67	'595	1'6	16	...	...	10'57	?	?	2'60	Bushire.	
1	54	46	126	44	3	1	26	58	11'6	?	?	71	'713	1'6	7	...	...	3'28	4'45	-1'17	0'88	Jask ‡	
16	17	14	40	61	27	31	71	78	4'9	?	?	67	'711	2'2	10	...	...	4'79	?	?	2'42	Muscat	ARABIA.
102	76	7	5	15	16	3	23	114	3'6	?	?	55	'330	2'1	16	...	...	6'30	?	?	0'95	Baghdad.	
27	8	73	131	35	33	40	13	5	11'0"	11'5	-4	74	'798	5'0	2	...	...	0'55	3'79	-3'24	0'14	Aden.	
14	2	4	142	79	5	68	32	16	16'6	?	?	73	'816	5'4	5	...	...	2'41	?	?	1'00	Perim.	
122	9	22	26	8	17	48	96	16	?	?	?	?	?	1'2	21	...	...	7'27	?	?	1'05	Kabul	AFGHANISTAN.
174	29	21	33	5	26	4	60	9	?	?	?	?	?	4'6	12	...	...	3'10	?	?	0'80	Kashgar	CENTRAL ASIA.
57	54	25	11	4	1	35	96	82	?	?	?	?	?	5'1	69	...	...	47'78	?	?	4'85	Amini Devi	ARABIAN ISLAND. SEA
20	40	25	8	7	5	13	109	76	7'2	?	?	77	'845	?	67	...	...	42'42	?	?	3'75	Milnicoy. ‡	
2	46	46	22	30	158	42	17	2	6'6	?	?	81	'807	6'7	59	...	...	27'50	55'30	-27'80	3'14	Zanzibar	AFRICA

XIII.—Extra India.

* Mean of 11 months.

‡ Wind observations of 359 days.

the data for that station are not utilized in calculating the provincial variations.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

METEOROLOGICAL PROVINCE.	STATION.	Elevation of bar-cistern above sea level in feet.	PRESSURE.						TEMPERATURE OF AIR.									
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.
BURMA COAST AND BAY ISLANDS.	Port Blair . . .	111	29°850	29°751	°096	26°799	—°009	29°791	86°8	76°9	9°9	93°4	69°3	24°1	83°8	84°2	80°7	+0°1
	Rangoon . . .		°863	°742	°121	°805	—°024	°783	89°7	72°3	17°4	102°7	58°8	42°9	82°2	85°4	78°8	0
	Diamond Island . . .		°869	°764	°105	°814	—°021	°790	85°4	76°6	8°8	92°0	69°5	22°5	82°8	82°9	79°9	+1°0
	Cocos Island . . .		°788	°697	°091	°748	?	°783	86°4	76°8	9°6	96°0	70°9	25°1	83°4	82°7	80°1	+0°8
	Akyab . . .		°868	°757	°111	°812	—°023	°775	86°3	71°9	14°4	97°8	53°2	44°6	80°5	83°1	78°4	+0°1
ASSAM . . .	Sh'char . . .		°784	°645	°139	°716	—°022	°771	88°2	67°4	20°8	101°6	44°5	57°1	79°5	85°9	76°8	+1°3
	Sibsagar . . .		°556	°421	°135	°489	—°025	°781	81°4	65°5	15°9	95°8	40°0	55°8	73°9	79°9	72°3	0
	Dhubri . . .		°660*	°620*	°040	°685	?	°755	83°2	68°2	15°0	98°8	44°6	54°2	76°3	81°9	74°4	+0°3
BENGAL AND ORISSA . . .	Chittagong . . .		°783	°673	°110	°728	—°030	°762	85°9*	69°9*	16°0	96°4	49°9	46°5	81°3*	83°0*	77°3*	?
	Narayanganj . . .		°830	°717	°113	°774	—°018	°748	86°1	70°5	15°6	99°3	49°3	50°0	80°2	83°8	78°0	+0°2
	Calcutta (Alipore) . . .		°827	°712	°115	°768	—°016	°734	86°5	69°9	16°6	103°4	48°4	55°0	80°5	81°5	77°8	—0°1
	Saugor Island . . .		°815	°705	°110	°757	—°025	°726	85°7	73°1	12°6	97°9	51°2	46°7	81°5	83°1	78°2	—0°1
	Burdwan . . .		°746	°623	°123	°682	—°021	°728	89°8	70°2	19°6	110°7	49°8	60°9	82°3	87°1	78°9	+0°1
	Berhampore . . .		°774	°658	°116	°714	—°018	°729	85°5†	69°3	16°2	108°1	47°6	60°5	80°8	86°1	76°7	?
	False Point . . .		°832	°725	°107	°779	—°025	°741	85°8	71°3	14°5	99°3	48°0	51°8	82°5	83°1	77°4	—0°3
	Cuttack . . .		°775	°649	°126	°714	—°018	°735	91°5	72°0	19°5	110°7	50°2	60°4	82°5	88°1	80°2	+0°1
	Hazaribagh . . .		27°817	27°718	°099	27°768	—°027	°710	85°0	65°9	19°1	108°6	40°4	68°2	78°3	82°1	74°6	+0°7
	Patna . . .		29°648	29°532	°116	29°589	—°024	°641	87°5	68°7	18°8	110°0	45°2	64°8	80°5	85°6	77°8	0
GANGETIC PLAIN AND CHOTA NAGPUR.	Darbhanga . . .		°665	°550	°115	°607	—°027	°727	83°7†	68°5	15°2	98°2	46°8	51°4	79°6	84°4	74°8†	?
	Allahabad . . .		°521	°405	°116	°458	—°021	°720	90°2	66°6	23°6	113°7	38°7	75°0	82°2	88°5	77°6	—0°2
	Lucknow . . .		°456	°347	°109	°398	—°024	°723	90°3	66°1	24°2	113°8	37°7	76°1	81°6	86°7	77°6	+0°1
	Dehra Dun . . .		27°601	27°510	°091	27°546	—°025	°738	81°6	60°8	20°8	102°6	38°5	61°1	73°5	77°5	69°9	+0°6
	Roorkee . . .		28°924	28°819	°105	28°863	—°021	°718	87°0	62°0	25°0	109°7	33°8	75°9	77°6	84°8	73°7	—0°4
WEST SUB-HIMALAYAS.	Meerut . . .		29°076	°974	°102	29°017	—°022	°721	87°9	64°2	23°7	109°5	34°4	75°1	79°0	85°9	75°4	+0°3
	Lahore . . .		°097	29°004	°093	°043	—°030	°713	88°9	64°5	24°4	114°8	35°2	79°6	78°7	88°2	76°1	+2°4
	Ludhiana . . .		28°993	28°897	°096	28°938	—°024	°718	88°7	65°0	23°7	115°4	35°6	75°8	78°8	86°5	75°9	+1°7
	Peshawar . . .		°714	°614	°100	°657	—°035	°752	86°3	59°6	26°7	117°5	29°9	87°6	77°2	88°3	71°8	+0°9
	Mooltan . . .		29°386	29°283	°103	29°327	—°026	°714	94°0	66°7	27°3	117°5	37°5	80°0	81°7	91°4	79°2	?
INDUS VALLEY AND N.-W. RAJPUTANA.	Jacobabad . . .		°621	°498	°123	°552	—°031	°694	98°0	65°7	32°3	123°0	33°4	89°6	85°4	95°8	80°8	+1°8
	Kurrachee . . .		°855	°740	°095	°786	—°020	°766	88°6	70°1	18°5	105°3	46°2	59°1	82°9	84°9	78°1	+0°8
	Jeypore . . .		28°420	28°316	°104	28°362	—°014	°739	92°1	66°2	25°9	112°5	37°0	75°5	83°3	89°9	78°1	+1°9
	Ajmere . . .		°238	°135	°103	°183	—°027	°741	90°8	65°8	25°0	110°4	34°0	76°4	81°1	89°1	77°6	+2°6
	Oodeypore . . .		27°910	27°812	°098	27°861	?	°709	91°2	68°1	23°1	108°2	39°5	68°7	84°2	88°6	79°0	?
EASTERN RAJPUTANA, CENTRAL INDIA AND GUJARAT.	Deesa . . .		29°395	29°279	°116	29°333	—°015	°747	95°5	67°6	27°9	114°4	42°2	72°2	85°5	93°5	81°1	+1°3
	Nowgong . . .		°038†	28°933†	°105	28°982	?	°688	91°2†	68°8†	22°4	113°8	37°3	76°5	83°6†	89°7†	79°7	?
	Agra . . .		°267	29°156	°111	29°203	—°033	°716	91°6	68°6	23°0	112°3	41°3	71°0	82°8	88°5	79°4	—1°5
	Belgaum . . .		27°367	27°264	°103	27°315	—°019	°752	84°8	61°0	20°8	101°8	49°9	51°9	77°5	80°8	72°9	+0°2
	Sholapur . . .		28°309	28°163	°137	28°234	—°014	°745	93°3	68°9	24°4	110°2	49°1	61°1	83°7	90°5	79°9	+0°8
DECCAN . . .	Poona . . .		°054	27°942	°112	°001	—°012	°761	90°5	65°7	24°8	108°9	46°0	62°9	81°3	87°1	76°8	+0°8
	Akola . . .		°938	28°803	°135	°867	—°013	°739	94°2	67°8	26°4	116°3	42°5	73°8	85°4	92°3	80°7	+1°4
	Baldana . . .	2,132	27°752	27°638	°114	27°692	—°012	°735	88°7	68°6	20°1	110°6	51°5	59°1	81°5	86°6	78°3	+1°2
	Khandwa . . .		28°818	28°694	°124	28°753	—°011	°744	93°3	67°9	25°4	114°9	40°1	74°8	84°5	91°7	80°0	+1°8

* Mean of 11 months.

II.

at 84 Stations in India, Burma, etc., for the year 1898.

TEMPERATURE, WET-BULB.				VAPOUR TENSION.					HUMIDITY.					CLOUD.				RAINFALL.		STATION.	METEOROLOGICAL PROVINCE.
Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Total rainfall for the year.	Highest rainfall during the year.		
74.2	78.3	78.2	76.9	.813	.900	.888	.867	-.015	88	78	76	80	-1	6.5	6.8	6.7	+1.1			Port Blair.	BURMA COAST AND BAY ISLANDS.
70.4	75.7	75.7	74.0	.731	.812	.769	.771	-.008	91	71	65	77	-1	5.1	5.5	5.3	0			Rangoon.	
73.0	76.6	76.0	75.2	.768	.838	.810	.805	-.001	83	74	73	77	-3	5.4	6.1	5.8	+0.6			Diamond Island.	
72.4	77.2	76.5	75.4	.742	.859	.837	.812	-.005	80	75	75	76	-3	4.3	5.0	4.7	-0.5	71.79	4.78	Cocos Island.	
69.9	75.5	77.3	74.2	.729	.832	.870	.810	+0.033	90	79	76	82	+3	4.2	3.7	4.0	-0.6			Akyab.	ASSAM.
65.5	72.7	73.6	70.6	.637	.737	.685	.686	-.024	90	72	55	73	-6	5.3	4.8	5.1	-0.3			Silchar.	
66.6*	70.9	73.2	70.8*	.677*	.742	.748	.736*	?	99*	86	71	85*	?	6.6	5.3	6.0	-0.5			Sibsagar.	
66.5	71.0	72.4	70.0	.659	.713	.689	.687	-.001	91	76	63	77	-1	4.1	5.9	4.0	-0.1			Dhubri.	
68.9*	75.4*	76.2*	73.7*	.721*	.818*	.827*	.788*	?	95*	75*	72*	81*	?	4.3	3.7	3.7	-0.6			Chittagong.	BENGAL AND ORISSA.
68.3	73.7	73.8	71.9	.695	.767	.724	.728	-.019	89	72	62	74	-2	4.9	4.8	4.9	+0.2			Narayanganj.	
68.1	72.8	72.9	71.3	.697	.730	.680	.702	-.034	91	67	57	72	-4	4.1	4.1	4.1	-0.2			Calcutta (All-pore).	
70.5	75.4	75.5	73.8	.745	.820	.803	.789	-.030	88	74	69	77	-3	4.9	4.5	4.7	-0.2			Saugor Island.	
67.7	73.2	73.5	71.5	.680	.723	.661	.689	+0.003	88	64	52	68	0	3.4	3.9	3.7	-0.7			Burdwan.	GANGETIC PLAIN AND NAGPUR.
66.1	72.6	72.6	70.4	.634	.718	.644	.665	-.027	83	67	53	68	-6	3.6	4.0	3.8	-1.0			Berhampore.	
70.0	75.9	76.4	74.1	.748	.827	.836	.804	+0.008	94	73	72	80	-1	4.6	4.4	4.5	-0.2			False Point.	
69.7	73.3	73.6	72.1	.722	.717	.655	.698	-.021	89	63	50	67	-2	3.4	4.0	3.7	-0.4			Cuttack.	
59.8	65.4	66.4	63.9	.471	.492	.476	.480	-.004	70	51	45	55	-2	4.1	4.8	4.5	-0.2			Hazaribagh.	UPPER SUB-HIMALAYAS.
64.5	70.9	71.9	69.1	.594	.657	.629	.627	+0.001	79	62	53	64	-1	3.2	3.1	3.2	-0.8			Patna.	
66.3	71.8	72.7	70.3	.656	.702	.672	.677	+0.006	89	68	56	71	0	2.6	2.4	2.5	-0.3			Darbhanga.	
62.1	69.7	71.3	67.7	.546	.598	.570	.571	0	77	53	43	58	-2	3.2	3.3	3.3	0			Allahabad.	
60.6*	69.5	71.2	66.5*	.515*	.589	.589	.541*	?	79*	54	47	56*	?	3.0	3.1	3.1	-0.5			Lucknow.	INDUS VALLEY AND N.-W. RAJPUTANA.
56.3	62.9	64.2	61.1	.433	.470	.461	.454	-.012	75	56	49	60	-3	3.6	4.4	4.0	+0.1			Dehra Dun.	
58.0	65.9	67.2	63.7	.477	.514	.465	.485	-.011	80	54	40	58	-1	2.8	2.9	2.9	-0.2			Roorkee.	
60.3	65.5	67.3	64.4	.526	.490	.453	.489	-.023	80	47	36	54	-4	2.5	2.6	2.6	-0.4			Meerut.	
58.4	65.8	68.7	64.3	.462	.506	.476	.481	-.008	69	50	35	51	0	2.2	2.1	2.2	-0.5			Lahore.	EASTERN RAJPUTANA, CENTRAL INDIA AND GUJARAT.
58.9	65.1	66.8	63.6	.468	.480	.431	.466	-.046	70	50	34	50	-8	3.2	3.1	3.2	-0.3			Ludhiana.	
53.8	63.3	64.9	60.7	.393	.454	.427	.425	+0.001	69	47	37	51	-2	2.4	3.5	3.0	-0.2			Peshawar.	
58.6	66.6	70.5	65.2	.438	.497	.506	.481	-.053	61	44	33	47	-7	1.1	1.3	1.2	-0.6			Mooltan.	
56.8†	67.5†	71.5†	65.3	.421†	.506†	.513†	.480	?	60†	38†	28†	42	?	1.4	2.0	1.7	-0.2			Jacobabad.	DECCAN.
65.0	71.1	73.0	69.7	.597	.637	.679	.638	-.032	73	54	55	61	-6	2.6	2.3	2.5	-0.7			Kurrachee.	
58.0	65.7	67.4	63.7	.425	.443	.416	.428	-.036	60	38	30	43	-7	2.8	3.6	3.2	-0.3			Jeypore.	
58.6	66.8	69.9	65.1	.451	.510	.514	.492	+0.002	64	46	38	49	-3	2.4	3.0	2.7	-0.1			Ajmere.	
61.2	68.1	69.4	66.2	.467	.509	.499	.492	?	67	44	39	50	?	2.6	3.2	2.9	?			Oodeypore.	
60.1	68.4	69.5	66.0	.463	.491	.421	.458	-.022	62	41	29	44	-2	2.8	2.8	2.8	-0.6			Deesa.	
62.9†	70.1†	71.3†	68.1	.536†	.589†	.546†	.537	?	71†	53†	43†	56	?	3.3†	4.2†	3.8	?			Nowgong.	
61.5	69.1	71.1	67.2	.503	.568	.560	.544	+0.037	65	49	41	52	0	2.4	2.8	2.6	-0.2			Agra.	
61.6	66.4	67.3	65.1	.530	.519	.510	.519	-.002	88	57	52	66	+2	4.1	4.8	4.5	-0.2			Belgaum.	
61.3	68.9	68.1	65.4	.470	.462	.416	.449	-.043	64	41	31	45	-5	3.6	5.3	4.5	-0.3			Sholapur.	
60.5	66.3	67.4	61.7	.496	.472	.434	.467	-.017	77	46	38	53	0	4.0	4.7	4.4	-0.1			Poona.	
60.6	68.6	69.9	66.4	.466	.491	.443	.466	-.025	65	42	32	47	-4	3.4	4.3	3.9	+0.1			Akola.	
59.2	64.9	65.9	63.3	.404	.424	.393	.407	-.059	57	41	31	44	-6	3.3	3.7	3.5	-0.5	22.80	1.81	Buldana.	
59.6	67.7	63.2	65.5	.444	.485	.447	.459	-.039	62	42	33	46	-6	2.9	3.6	3.3	-0.2			Khandwa.	

† Mean of 10 months.

Table

Abstract of Observations recorded at 10 A.M. and 4 P.M.

METEOROLOGICAL PROVINCE.	STATION.	Elevation of Bar-Cistern above sea level in feet.	PRESSURE.						TEMPERATURE OF AIR.									
			Mean of 10 hours.	Mean of 16 hours.	Mean daily range.	Mean daily pressure.	Variation from normal.	Mean reduced to S. L. and for gravity 45° Lat.	Mean maximum.	Mean minimum.	Mean daily range.	Highest maximum.	Lowest minimum.	Absolute range.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.
DECCAN—(concl.)	Hoshangabad . . .		28'854	28'726	128	28'787	—'010	29'745	91'3	67'9	23'4	113'4	41'8	71'6	82'0	89'3	78'9	+0'8
	Nagpur . . .		'831	'702	129	'764	—'006	'734	92'3	68'8	23'5	114'2	46'6	67'6	82'8	89'4	80'0	+0'4
	Nagpur (Sanitary Commr.'s Office). Jubbulpore . . .		'844	'718	126	'778	?	'737	93'7	68'5	25'2	115'7	45'4	70'3	84'4	91'0	80'4	?
	Saugor . . .		'509	'393	116	'448	?	'721	89'0	64'0	25'0	113'0	34'6	78'4	80'4	86'7	75'7	+0'2
	Sutna . . .		'044	27'944	100	27'995	—'009	'734	88'4	68'0	20'4	110'8	45'1	65'7	81'6	86'2	77'2	+1'3
	Rajpur . . .		'782	28'673	109	28'724	—'019	'718	88'7	66'5	22'2	111'6	38'1	73'5	82'2	86'8	76'8	+0'8
	Hyderabad (Deccan)		'681	'757	124	'816	—'006	'634	90'9	69'4	21'5	113'0	46'6	66'4	82'5	88'5	79'7	+0'7
WEST COAST	Bombay . . .		'195	'073	123	'134	—'012	'747	91'0	69'2	21'8	109'2	49'3	59'9	82'8	88'2	79'4	+0'8
	Ratnagiri . . .		29'864	29'762	102	29'809	—'015	'785	86'7	75'7	11'0	94'9	62'3	32'6	81'6	83'8	80'5	+0'9
	Karwar . . .		'788	'691	097	'734	—'014	'782	88'2	74'1	14'1	97'8	60'9	36'9	84'3	84'3	80'1	+0'8
	Cochin . . .		'869	'763	106	'811	—'021	'787	86'7	72'9	13'8	93'5	58'6	34'9	81'4	84'6	79'2	+0'5
SOUTH INDIA	Salem . . .		'916	'829	087	'869	—'016	'805	88'5	75'2	13'3	96'6	66'3	30'3	83'5	85'0	81'0	+0'7
	Mercara . . .		28'987	28'847	140	28'925	—'024	'793	93'2	71'2	22'0	104'7	56'5	48'2	83'8	89'1	80'2	+0'6
	Chitaldroog . . .		26'229	26'140	089	26'193	—'014	?	76'2	62'2	14'0	91'0	51'7	39'3	69'9	72'1	68'2	+0'4
	Bangalore . . .		27'516	27'402	114	27'461	—'012	'765	86'6	67'2	19'4	101'3	54'7	46'6	78'8	84'0	76'3	+0'4
	Hassan . . .		26'938	26'824	114	26'886	—'017	'773	84'8	64'5	20'3	97'7	51'9	45'8	76'6	81'8	73'9	+1'0
	Mysore . . .		'875	'777	098	'831	—'014	'789	82'7	62'2	20'5	97'4	46'9	50'5	76'7	79'7	71'8	+0'3
	Trichinopoly . . .		27'429	27'311	118	27'370	—'015	'782	86'4	65'6	20'8	99'0	54'1	44'9	78'5	83'1	75'2	+0'1
	Madras . . .		29'650	29'510	140	29'588	—'020	'772	95'0	74'5	20'5	108'0	60'3	47'7	87'0	92'1	83'1	+0'9
	Bellary . . .		'882	'766	116	'827	—'014	'784	91'0	74'3	16'7	109'8	59'8	50'0	85'9	85'7	81'4	—0'4
	Cocanada . . .		28'426	28'292	134	28'361	—'018	'760	93'0	70'7	22'3	108'2	53'7	54'5	83'8	89'8	80'7	+0'1
	Vizagapatam . . .		29'856	29'736	120	29'794	?	'756	89'3	74'8	14'5	111'0	58'7	52'3	84'4	86'8	81'4	0
	Quetta . . .		'840	'729	111	782	—'013	'761	88'7	73'7	15'0	103'5	55'3	48'2	85'3	85'4	81'4	—0'6
	Leh . . .		24'631	24'551	030	24'583	0	?	75'3	43'5	31'8	98'6	15'6	83'0	66'0	72'4	58'7	+0'6
	Srinagar . . .		19'703	19'613	090	19'664	0	?	57'4	31'1	26'3	88'7	—1'5	90'2	45'9	53'7	43'6	+2'4
HILL STATIONS, NORTH- WEST INDIA.	Murree . . .		24'885	24'791	094	24'830	—'019	?	68'6	43'9	24'7	96'9	18'3	78'6	57'6	66'3	55'7	+1'3
	Kallang . . .	10,087	23'825	23'787	038	23'799	—'013	?	65'5	52'7	12'8	93'3	20'0	73'3	60'2	62'3	58'3	+1'5
	Simla (Ridge)		?	?	?	?	?	?	59'1	28'0	61'1	85'2	0'0	85'2	48'5	52'8	38'0	?
	Chakrata . . .		23'108	23'058	050	23'076	—'003	?	61'8	50'4	11'4	81'5	23'0	58'5	57'2	58'7	55'3	—0'2
	Ranikhet . . .		'281	'226	055	'246	—'007	?	64'3	50'0	14'3	81'5	25'3	56'2	59'6	59'1	55'8	0
	Muktesar . . .		24'097	24'025	072	24'049	—'004	?	68'2	54'1	14'1	88'3	31'8	56'5	63'2	64'5	60'2	+0'4
	Katmandu . . .	4,388	22'851	22'790	061	22'821	?	?	64'1	49'2	14'9	84'2	28'1	56'1	58'2	59'6	55'5	?
	Darjeeling . . .		25'560	25'479	081	25'518	?	?	77'4	54'0	23'4	91'8	29'0	62'8	67'9	72'4	64'5	—0'4
	Mount Abu . . .		22'981	22'916	065	22'947	—'006	?	59'6	50'9	8'7	75'6	?	?	54'6	55'4	54'7	?
	Pachmarhi . . .		26'030	25'961	069	25'991	—'020	?	76'4	63'3	13'1	93'7	41'6	52'1	71'9	74'4	69'3	+1'1
HILL STATIONS, CENTRAL INDIA.	Chikalda . . .	3,642	'435	26'346	089	26'388	—'009	?	80'4	61'2	19'2	101'7	35'5	66'2	74'9	78'6	70'5	+0'8
	Wellington . . .		'321	'230	091	'272	—'013	?	80'4	65'1	15'3	100'0	45'3	54'7	74'2	78'8	72'5	+1'2
	Aden . . .		24'239	24'170	069	24'204	—'012	?	71'9	53'1	18'8	82'4	33'2	49'2	67'8	67'0	61'3	+0'2
	Perim . . .		29'820	29'705	115	29'759	—'015	'784	87'9	77'8	10'1	99'5	67'4	32'1	84'0	86'0	82'6	+0'4
	Zanzibar . . .		'690	'582	108	'632	?	?	89'5	79'6	9'9	102'9	70'6	32'3	85'7	86'5	83'3	—0'1
HILL STATION, SOUTH INDIA. EXTRA INDIA	Port Victoria (Seychelles).	15	'983	'865	118	'924	—'019	'924	84'8	77'8	7'6	91'0	70'0	21'0	80'6	84'1	80'8	+1'2
			'963	'881	082	'922	—'022	'861	82'9	76'1	6'8	88'1	69'7	18'4	81'3	82'0	79'3	—0'1

II—concl'd.

at 84 Stations in India, Burma, etc., for the year 1898—concl'd.

TEMPERATURE, WET-BULB.				VAPOUR TENSION.					HUMIDITY.					CLOUD.				RAINFALL.		STATION.	METEOROLOGICAL PROVINCE.
Mean minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	From minimum.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Mean 10 hours.	Mean 16 hours.	Mean daily.	Variation from normal.	Total rainfall for the year.	Heaviest rain-fall during the year.		
60.8	68.3	70.6	66.6	479	544	531	518	-.012	67	52	42	53	-3	3.2	3.7	3.5	-.02			Hoshangabad.	DECCAN—COOLD.
61.7	68.2	69.8	66.6	490	530	499	506	-.022	67	48	39	51	-2	3.7	4.7	4.2	-.02			Nagpur . .	
62.1	69.6	70.9	67.5	506	541	518	522	?	70	47	39	52	?	3.3	4.2	3.8	?			Nagpur (Sany. Commr.'s Office).	
59.4	67.3	68.9	65.2	483	527	506	506	-.003	78	52	43	58	0	3.2	4.2	3.7	-.02			Jubbulpore.	
60.5	65.6†	67.0†	63.4	463	481†	469†	492	?	63	47†	41†	53	?	2.8	4.1	3.5	+0.6			Saugor.	
60.0	66.9	67.5	64.8	482	502	464	484	+0.15	69	46	39	51	0	2.3	2.9	2.6	-.06			Sutna.	
62.3	68.5	69.3	66.7	498	531	476	502	-.042	67	49	39	52	-5	3.4	4.2	3.8	-.03			Raipur.	
64.1	70.0	70.2†	67.9†	553	581	537†	557†	?	76	53	43†	58†	?	3.6	4.2	3.9	-.06			Hyderabad (Decan).	
70.5	74.8	76.2	73.8	691	782	808	760	-.015	76	72	70	73	-4	3.7	3.5	3.6	-.07			Bombay . .	WEST COAST.
70.1	74.5	75.9	73.5	696	734	787	739	-.001	81	63	67	70	-1	3.6	3.9	3.8	+0.5			Ratnagiri.	
70.4	74.3	75.8	73.5	723	761	779	754	-.006	88	71	66	75	-2	3.5	4.1	3.8	+0.1			Karwar.	
72.9	76.3	77.1	75.4	781	817	830	810	-.005	89	71	69	76	-3	4.6	5.4	5.0	+0.4			Cochin.	
68.8†	74.0	74.9	72.2†	688†	713	678	691†	?	91†	62	52	69†	?	4.3	5.9	5.1	+0.6			Salem . .	SOUTH INDIA.
59.9	64.2	64.7	62.9	485	541	530	522	-.011	87	75	70	77	-2	5.6	6.8	6.2	-.02			Mercara.	
62.3	68.0	67.9	66.1	511	557	486	518	+0.12	76	58	44	59	+1	5.2	5.6	5.4	+0.4			Chitaldroog.	
61.9	67.0	67.0	65.3	530	557	495	528	-.007	86	61	48	65	-1	4.7	5.3	5.0	+0.4			Bangalore.	
60.7	66.1	66.1	64.3	529	524	490	513	-.014	92	58	52	67	-2	5.8	6.6	6.2	+0.2			Hassan.	
62.9	68.0	67.6	66.2	549	560	488	532	-.016	86	58	46	63	-2	5.9	6.2	6.1	+0.6			Mysore.	
70.7	73.8	74.7	73.0	705	660	627	664	-.026	82	52	44	60	-3	4.0	5.1	4.6	-.10			Trichinopoly.	
?	76.2	77.0	75.6	?	778	811	816	+0.32	?	64	66	77	+3	5.2	4.8	5.0	+0.1			Madras.	
64.1	67.9	69.2	67.1	526	487	462	492	-.057	70	42	34	49	-4	5.6	6.6	6.1	+1.1			Bellary.	
71.7	74.5	74.9	73.7	750	732	716	733	-.030	85	62	57	68	-3	3.1	2.9	3.0	-.05			Cocanada.	
71.4	75.8	76.2	74.5	755	775	792	774	+0.30	90	63	65	73	+5	4.7	4.7	4.7	+0.6			Vizagapatam.	
38.0	51.1	53.4	47.5	196	249	234	226	-.023	64	37	30	43	-6	1.9	2.7	2.3	+0.2			Quetta . .	HILL STATION,
27.1	35.2	40.0	34.1	133	136	150	140	+0.04	68	42	39	50	-1	4.9	5.8	5.4	-.01			Leh. . .	BALUCHISTAN.
42.8	53.3	59.0†	50.4	281†	412	500†	354	?	1†	76	74†	80	?	3.7	4.6	4.2	-.04			Srinagar.	HILL STATION,
44.0	49.9	51.8	48.6	223	283	309	272	-.009	3	51	52	52	-4	2.4	3.3	2.9	-.19			Murree.	NORTHERN INDIA.
31.2	39.3	40.8	37.1	126	192	175	130||	?	80||	50	42	57||	?	4.8	6.2	5.5	0	18.27	3.57	Kailang.	
44.3	48.3	50.2	47.6	249	271	299	273	-.015	63	54	57	58	-2	4.5	5.5	5.0	-.01			Simla (Ridge).*	
45.4†	50.6	50.6	47.4†	240†	297	304	265†	?	65†	57	59	58†	?	3.9	4.7	4.3	-.03			Chakrata . .	
49.3	54.1	55.1	52.8	318	342	353	338	-.007	72	58	57	62	-2	4.0	4.5	4.3	-.02			Ranikhet.	
43.5	49.4	50.9	48.0	248	285	305	279	?	65	57	58	60	?	4.7	5.4	5.1	?			Muktesar.	
52.7	60.1†	62.1†	57.9	418	473†	472†	447	?	91	68†	58†	72	?	3.8	4.7	4.3	-.04	63.38	2.55	Katmandu .	
46.5	52.4	52.9	50.6	346†	389	394	401†	?	88†	87	86	88†	?	5.8†	6.7†	6.3	?			Darjeeling .	
53.8	58.6	59.8	57.4	324	357	365	348	-.017	55	47	44	49	-4	2.8	3.1	3.0	-.07			Mount Abu .	HILL STATIONS,
56.0	63.4	65.2	61.5	416	466	483	455	+0.35	74	55	51	60	+3	3.2	3.9	3.6	-.06			Pachmarhi .	CENTRAL INDIA.
57.5	61.5	63.5	60.9	403	414	421	413	-.020	65	52	47	54	-5	3.5	4.3	3.9	-.05	57.43	5.61	Chikalda .	
50.4	58.0	58.9	55.7	346	385	417	383	-.009	84	58	65	69	-3	5.5	6.7	6.1	+0.3			Wellington .	HILL STATION,
71.4	76.0†	74.7†	74.1†	687†	789†	706†	730†	?	72	60†	56†	65†	?	3.8	2.2	3.0	+0.6			Aden.	SOUTH INDIA,
73.6	76.5	76.8	75.7	760	809	803	790	+0.32	75	66	63	68	+3	4.4	4.0	4.2	+2.2			Perim.	EXTRA INDIA.
73.1	75.4	75.3	74.6	766	812	764	781	-.012	82	77	65	75	-4	6.3	4.7	5.5	+0.8			Zanzibar.	
72.2	75.4	75.6	74.4	742	806	801	783	-.002	82	76	73	77	-1	6.0	6.2	6.1	-.02	97.92	5.30	Port Victoria (Seychelles).	

* Mean of 10 months.

† Mean of 11 months.

‡ Mean of 8 months.

| Mean of 9 months.

T

EXPLANATION OF PLATES.

PLATE I.—A chart of India showing the 11 meteorological provinces and 57 districts of India.

PLATE II.—A chart of India showing the normal average rainfall and the variation of the rainfall from the normal of the months of January and February 1898. This chart and the three following charts have been prepared to illustrate the data given in Table XX. These charts are drawn up in the same manner as the rainfall chart (Plate V) in the Monthly Weather Reviews of the year 1898.

PLATE III.—A chart of India showing the normal average rainfall and the variation of the rainfall from the normal of the months of March to May 1898.

PLATE IV.—A chart of India showing the normal average rainfall and the variation of the rainfall from the normal of the months of June to October 1898.

PLATE V.—A chart of India showing the normal average rainfall and the variation of the rainfall from the normal of the months of November and December 1898.

PLATE VI.—Chart showing the tracks of the more important cyclonic storms of 1898 in the Indian area during the south-west monsoon, a brief summary of which is given on pages 709 to 711.



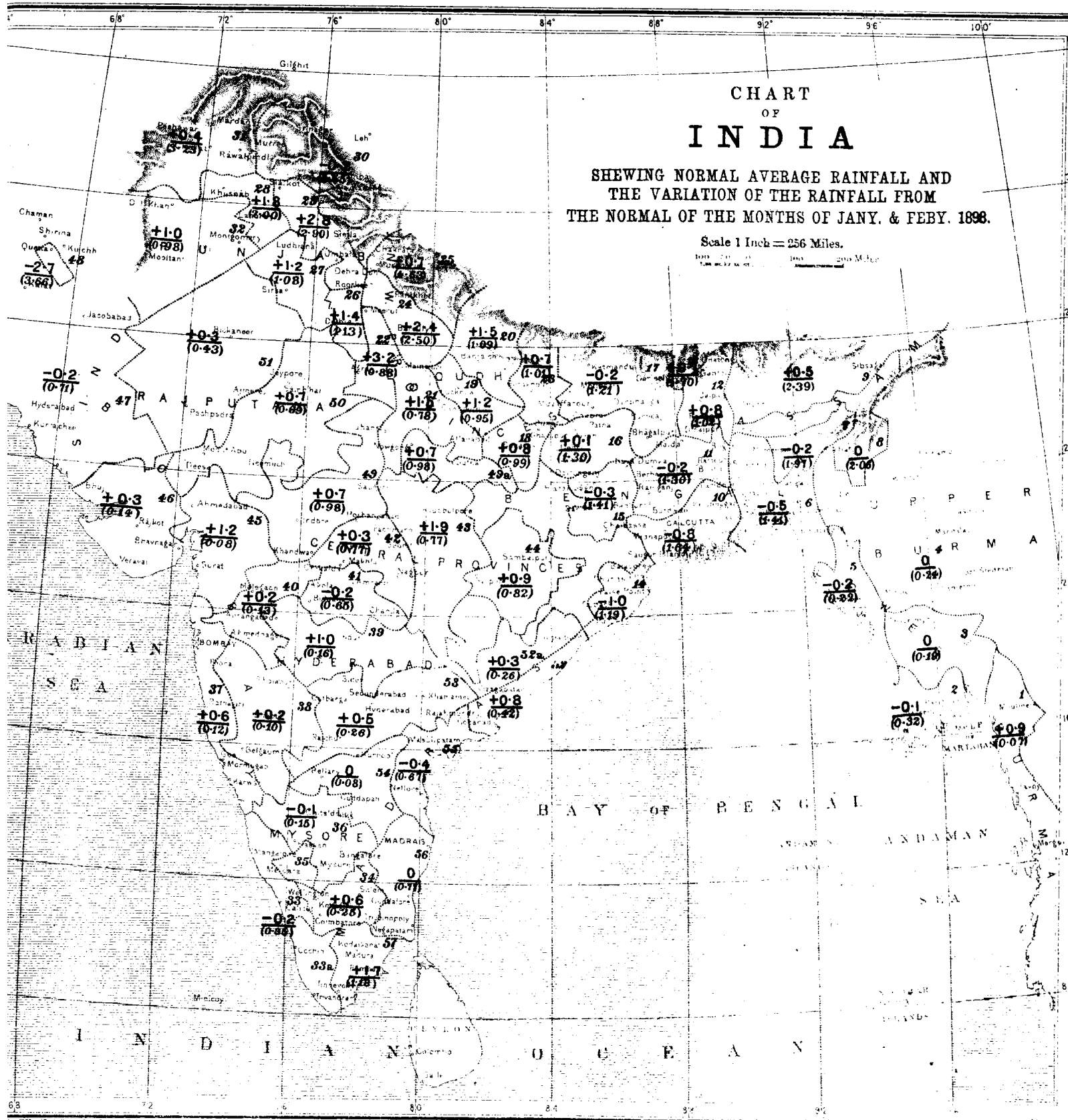
No 340, Wr., I.—Oct 99—395

Litho. S. I. O. Calcut

Explanation.

The name of the districts can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

1. Tenasserim	17. North Bihar	33. Malabar	48. Baluchistan Hills
2. Lower Burma Deltaic	18. North Western Provinces, East	33a. Travancore	49. Central India, East
3. Central do.	19. South Oudh	34. Madras, South Central	49a. Do. do.
4. Upper do.	20. North do.	35. Coorg	50. Rajputana East, Central India
5. Arakan	21. North Western Provinces, Central	36. Mysore	West
6. East Bengal	22. Do. do. West	37. Konkan	51. West Rajputana
7. Assam, Surma	23. Do. do. East Submontane	38. Bombay Deccan	52. Madras, East Coast, North
8. Do., Hills	24. Do. do. West do.	39. Hyderabad, North	52(a). Do. do. do. (a)
9. Do., Brahmaputra	25. Do. do. Hills	40. Khandesh	53. Hyderabad, South
10. Deltaic Bengal	26. South East Punjab	41. Berar	54. Madras, Central
11. Central do.	27. South do.	42. Central Provinces, West	55. Madras, East Coast, Central
12. North do.	28. Central do.	43. Do. Central	56. Do. East Coast, South
13. Bengal Hills	29. Punjab, Submontane	44. Do.	57. Madras, South
14. Orissa	30. Do. Hills	45. Gujarat	
15. Chota Nagpur	31. North Punjab	46. Kathiawar	
16. South Bihar	32. West do.	47. Sind	



Explanation.

The Chart gives the variations of the rainfall of the month (to tenths or an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or - sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

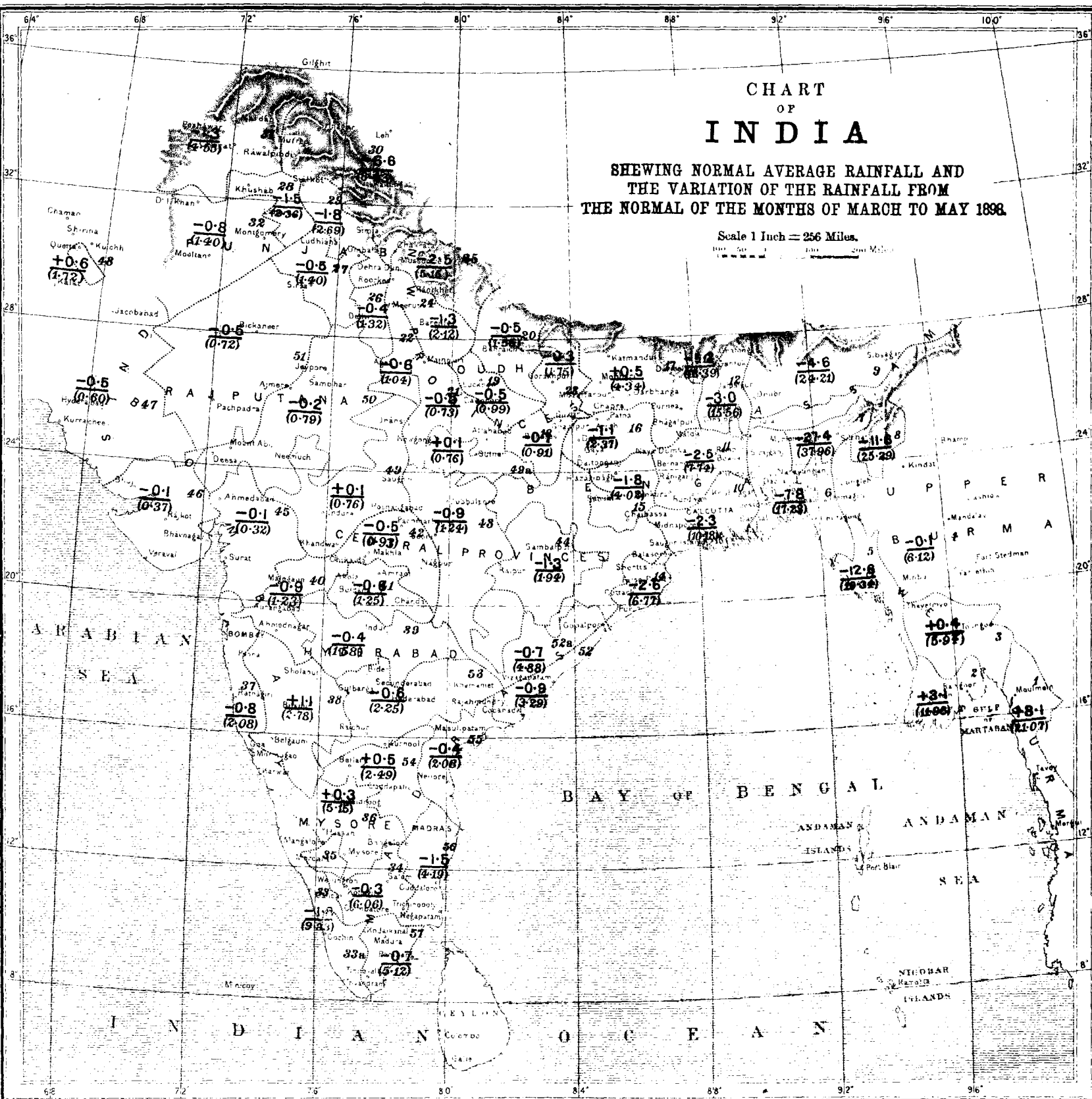
1. Tenasserim	17. North Bihar	33. Malabar	49. Central India, East
2. Lower Burma Deltaic	18. North Western Provinces, East	34. Travancore	50a. Do. do.
3. Central do.	19. South Oude	35. Madras, South Central	50. Rajputana East, Central India
4. Upper do.	20. North do.	36. Coorg	51. West Rajputana
5. Arakan	21. North Western Provinces, Central	37. Mysore	52. East Coast, North
6. East Bengal	22. Do. do. West	38. Konkani	52a. Do. do. (a)
7. Assam, Serma	23. Do. do. East Sikkim	39. Bombay Deccan	53. Hyderabad, South
8. Do., Hills	24. Do. do. West do.	40. Hyderabad, North	54. Madras, Central
9. Do., Brahmaputra	25. Do. do. Hills	41. Khandish	55. East Coast, Central
10. Deltaic Bengal	26. South East Punjab	42. Inar	56. East Coast, South
11. Central do.	27. South do.	43. Central Provinces, West	57. Madras, South
12. North do.	28. Central do.	44. Do., Central	
13. Bengal Hills	29. Punjab, Submontane	45. Do., East	
14. Orissa	30. Do., Hills	46. Gujarat	
15. Chota Nagpur	31. North Punjab	47. Kathiawar	
16. South Bihar	32. West do.	48. Sind	
		49. Baluchistan Hills	

CHART OF INDIA

SHEWING NORMAL AVERAGE RAINFALL AND
THE VARIATION OF THE RAINFALL FROM
THE NORMAL OF THE MONTHS OF MARCH TO MAY 1898.

Scale 1 Inch = 256 Miles.

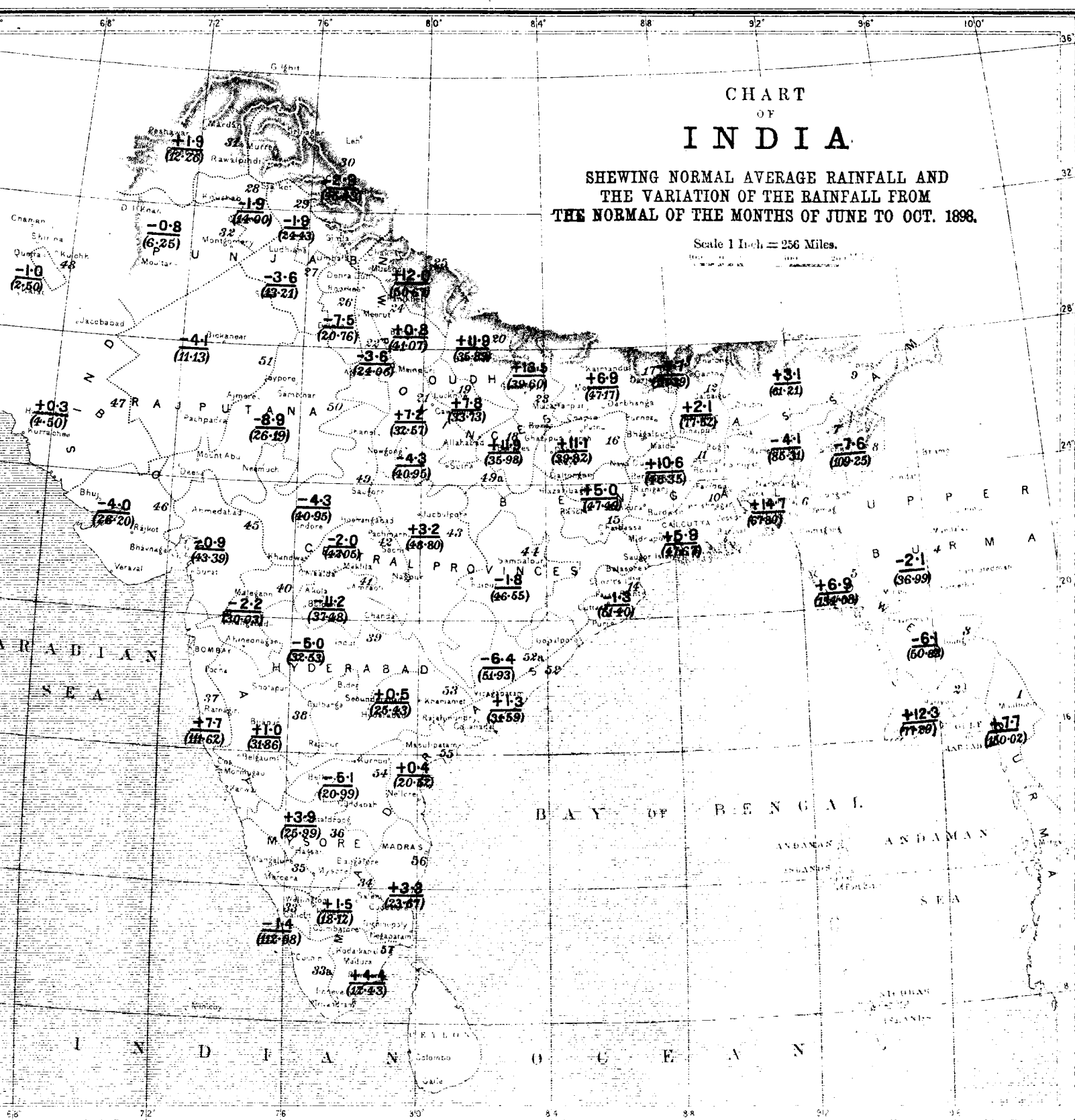
100 200 300 Miles



Explanation.

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or - sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

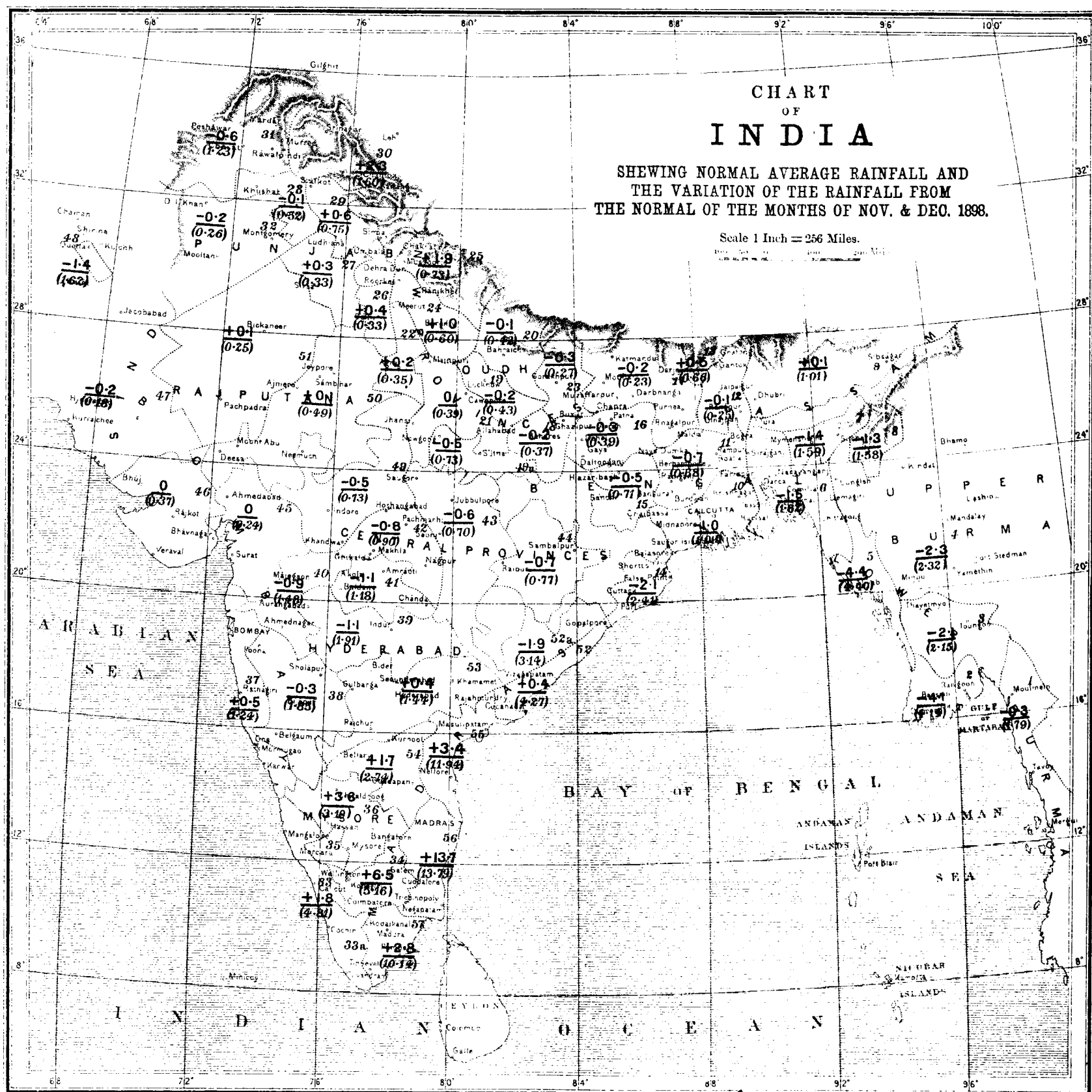
1. Tenasserim	17. North Bli	33. Madhar	49. Central India, East
2. Lower Burma Deltaic	18. North Western Provinces, East	33a. Travancore	49a. Do. do.
3. Central do.	19. South Orin	34. Madras, South Central	50. Rajputana East, Central India
4. Upper do.	20. North do.	35. Coorg	West
5. Arakan	21. North Western Provinces, Central	36. Mysore	51. West Rajputana
6. East Bengal	22. Do. do. West	37. Konkan	52. East Coast, North
7. Assam, Surma	23. Do. do. East Submontane	38. Bombay Decan	52a. Do. do. (a)
8. Do., Hills	24. Do. do. West do.	39. Hyderabad, North	53. Hyderabad, South
9. Do., Brahmaputra	25. Do. do. Hills	40. Khandish	54. Madras, Central
10. Deltaic Bengal	26. South East Punjab	41. Berar	55. East Coast, Central
11. Central do.	27. South do.	42. Central Provinces, West	56. East Coast, South
12. North do.	28. Central do.	43. Do., Central	57. Madras, South
13. Deccan Hills	29. Punjab, Submontane	44. Do., East	
14. Orissa	30. Do., Hills	45. Gujarat	
15. Chota Nagpur	31. North Punjab	46. Kathiawar	
16. South Bihar	32. West do.	47. Sind	
		48. Baluchistan Hills	



Explanation.

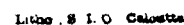
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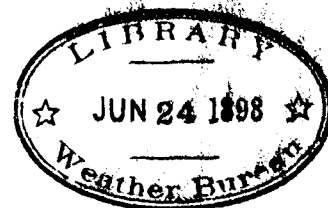
1. Tenasserim	17. North Bihar	33. Malabar	49. Central India, East
2. Lower Burma Deltaic	18. North Western Provinces, East	34. Travancore	50a. Do. do
3. Central do.	19. South Oudh	35. Madras, South Central	50. Rajputana East, Central India
4. Upper do.	20. North do.	36. Mysore	51. West Rajputana
5. Arakan	21. North Western Provinces, Central	37. Konkan	52. East Coast, North
6. East Bengal	22. Do. do. West	38. Bombay Deccan	52a. Do. do. (C)
7. Assam, Surma	23. Do. do. East Sikkim	39. Hyderabad, North	53. Hyderabad, South
8. Do., Hills	24. Do. do. West do.	40. Kandish	54. Madras, Central
9. Do., Badamaputra	25. Do. do. Hills	41. Berar	55. East Coast, Central
10. Deltaic Bengal	26. South East Punjab	42. Central Provinces, West	56. East Coast, South
11. Central do.	27. South do.	43. Do. Central	57. Madras, South
12. North do.	28. Central do.	44. Do. East	
13. Bengal Hills	29. Punjab, Submontane	45. Gujarat	
14. Orissa	30. Do. Hills	46. Kathiawar	
15. Chota Nagpur	31. North Punjab	47. Sind	
16. South Bihar	32. West do.	48. Baluchistan Hills	

**Explanation.**

The Chart gives the variations of the rainfall of the month (to tenths of an inch) from the normal over the whole of India and Burma; with the exception of Upper Burma, for which rainfall data have not been obtained for a sufficient number of years to furnish reliable and useful means. The country is divided into 57 areas, over each of which the meteorological conditions are fairly uniform, and the staple crops similar in character; and the means (both actual and normal for the month) have been calculated, and the numbers given in the centre of each division (usually with a + or - sign attached) give the difference between the actual and normal mean rainfall of the district of the month. A plus sign indicates that the rainfall was in excess, and a negative sign that it was in defect by the amounts indicated by the numbers to which the signs are attached. The normal average rainfall is also given below in smaller figures enclosed within brackets so that the percentage variation can be at once estimated. The name of the district can be at once ascertained by referring in the following list to the number given near the right hand boundary of each district in small slanting red figures.

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3. Central do.	19. South Oude	34. Madras, South Central	50. Rajputana East, Central India
4. Upper do.	20. North do.	35. Coorg	West
5. Assam	21. North Western Provinces, Central	36. Mysore	51. West Rajputana
6. East Bengal	22. Do. do. West	37. Konkan	52. East Coast, North
7. Assam, Surma	23. Do. do. East Sikkim	38. Bombay Deccan	52a. Do. do. (a)
8. Do. Hills	24. Do. do. West do.	39. Hyderabad, North	53. Hyderabad, South
9. Do. Brahmaputra	25. Do. do. Hills	40. Khamti	54. Madras, Central
10. Deltaic Bengal	26. South East Punjab	41. Berar	55. East Coast, Central
11. Central do.	27. South do.	42. Central Provinces, West	56. East Coast, South
12. North do.	28. Central do.	43. Do. Central	57. Madras, South
13. Bengal Hills	29. Punjab, Submontane	44. Do. East	
14. Orissa	30. Do. Hills	45. Gujarat	
15. Chota Nagpur	31. North Punjab	46. Kathiawar	
16. South Bihar	32. West do.	47. Sind	
		48. Baluchistan Hills	





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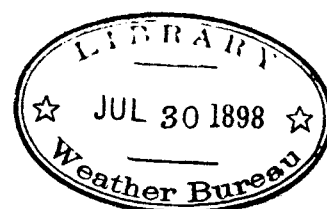
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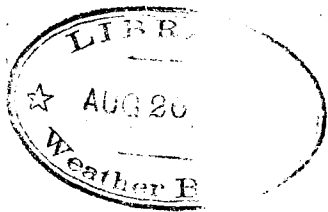
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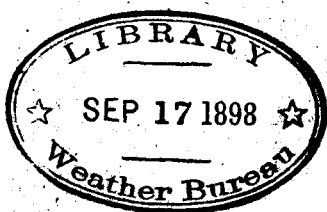
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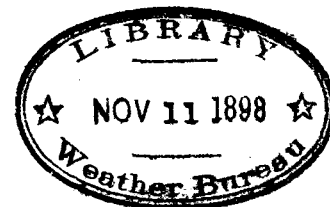
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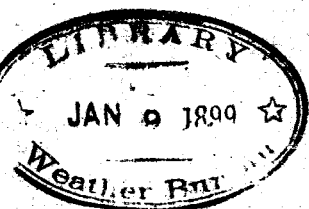
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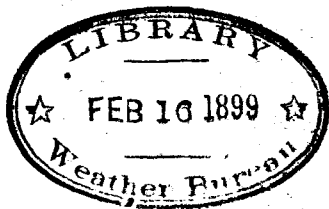
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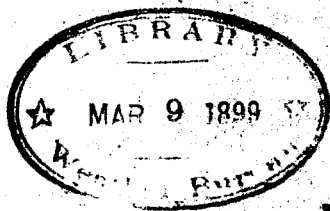
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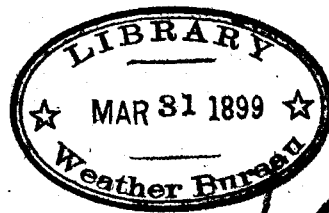
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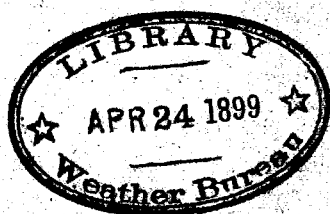
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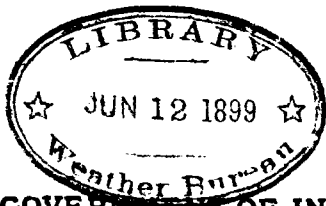
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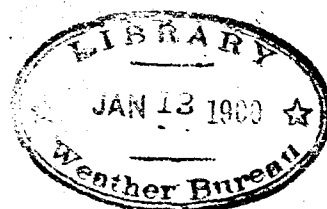
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